ORDER NO. HAD8706179C2

Service Manual

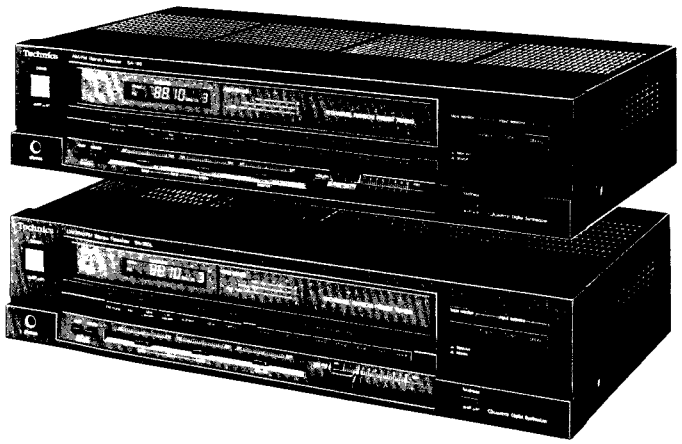
Receiver

QUARTZ Synthesizer AM/FM Stereo Tuner Receiver **SA-180**
(SA-180)

QUARTZ Synthesizer LW/MW/FM Stereo Tuner Receiver **SA-180L**
(SA-180L)

Color

(S) .....Silver Type
(K) .....Black Type



(SA-180)

(SA-180L)

Area

color	area
(S)(K)	(EX) .....Continental Europe. (SA-180)
(K)	(EK) .....United Kingdom. (SA-180L)
(S)(K)	(EB) .....Belgium. (SA-180L)
(S)(K)	(EH) .....Holland. (SA-180)
(S)(K)	(EF) .....France. (SA-180L)
(S)(K)	(EW) .....Switzerland. (SA-180L)
(S)(K)	(Ei) .....Italy. (SA-180)

SPECIFICATIONS

(DIN 45 500)

■ AMPLIFIER SECTION

1 kHz continuous power output	
both channels driven	2 x 35W (8Ω)
Total harmonic distortion	
half power at 1 kHz	0.07% (8Ω)
Intermodulation distortion	
rated power at 60 Hz: 7 kHz = 4:1, SMPTE, 8Ω	0.5%
Power bandwidth	
both channels driven, -3 dB	10 Hz~ 40 kHz (8Ω)
Damping factor	20 (8Ω)
Input sensitivity and impedance	
PHONO	2.5 mV/ 47 kΩ
CD/ AUX, TAPE/ EXT	150 mV/ 22 kΩ
PHONO maximum input voltage (1 kHz, RMS)	150 mV
S/ N	
rated power (8Ω)	
PHONO	70 dB (IHF, A: 72 dB)
CD/ AUX, TAPE/ EXT	88 dB (IHF, A: 95 dB)
Frequency response	
PHONO	RIAA standard curve ±0.8 dB (30 Hz~ 15 kHz)
CD/ AUX, TAPE/ EXT	10 Hz~ 70 kHz (-3 dB)
Tone controls	
BASS	50 Hz, +10 dB~ -10 dB
TREBLE	20 kHz, +10 dB~ -10 dB
Loudness control (volume at -30 dB)	50 Hz, +9 dB
Output voltage	
REC OUT	150 mV
Channel balance, 250 Hz~ 6,300 Hz	±1 dB
Channel separation, 1 kHz	55 dB
Headphones output level and impedance	390 mV/ 330Ω
Load impedance	
MAIN or REMOTE	8Ω~ 16Ω
MAIN and REMOTE	8Ω~ 16Ω

■ FM TUNER SECTION

Frequency range	87.50~ 108.00 MHz
Sensitivity	
S/ N 30 dB	1.5 µV (75Ω)
S/ N 26 dB	1.3 µV (75Ω)
S/ N 20 dB	1.2 µV (75Ω)
IHF usable sensitivity	1.5 µV (IHF '58, 75Ω)
IHF 46 dB stereo quieting sensitivity	22µV/ 75Ω
Total harmonic distortion	
MONO	0.15%
STEREO	0.3%
S/ N	
MONO	60 dB (75 dB, IHF)
STEREO	58 dB (71 dB, IHF)
Frequency response	20 Hz~ 15 kHz, +1 dB~ -2 dB
Alternate channel selectivity	±400 kHz, 65 dB
Capture ratio	1.0 dB
Image rejection at 98 MHz	40 dB
IF rejection at 98 MHz	70 dB

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

Spurious response rejection at 98 MHz	70 dB
AM suppression	50 dB
Stereo separation	
1 kHz	40 dB
10 kHz	30 dB
Carrier leak	
19 kHz	-30 dB (-35 dB, IHF)
38 kHz	-45 dB (-50 dB, IHF)
Channel balance (250 Hz~ 6,300 Hz)	±1.5 dB
Limiting point	1.2 µV
Bandwidth	
IF amplifier	180 kHz
FM demodulator	1000 kHz
Antenna terminals	75Ω (unbalanced)

■ AM TUNER SECTION (SA-180)

Frequency range	522~ 1611 kHz (9 kHz-step) 530~ 1620 kHz (10 kHz-step)
Sensitivity (S/ N 20 dB)	20 µV, 330 µV/ m
Selectivity	55 dB
Image rejection at 999 kHz	40 dB
IF rejection at 999 kHz	55 dB

■ AM TUNER SECTION (SA-180L)

Frequency range	
MW	522~ 1611 kHz (9 kHz-step) 530~ 1620 kHz (10 kHz-step)
LW	155~ 353 kHz (153~ 351 kHz, -2 kHz shift)

Sensitivity (S/ N 20 dB)	
MW	20 µV, 330 µV/ m
LW	45 µV
Selectivity	
MW (at 999 kHz)	55 dB
LW (at 254 kHz)	55 dB
Image rejection	
MW (at 999 kHz)	40 dB
LW (at 254 kHz)	40 dB
IF rejection	
MW (at 999 kHz)	55 dB
LW (at 254 kHz)	40 dB

■ GENERAL

Power consumption	200W
Power supply	
For United Kingdom	AC 50 Hz/ 60 Hz, 240V
For continental Europe	AC 50 Hz/ 60 Hz, 220V
Dimensions (W X H X D)	430 X 97 X 243 mm (16-15/ 16" X 3-13/ 16" X 9-9/ 16")
Weight	4.5 kg (9.9 lb.)

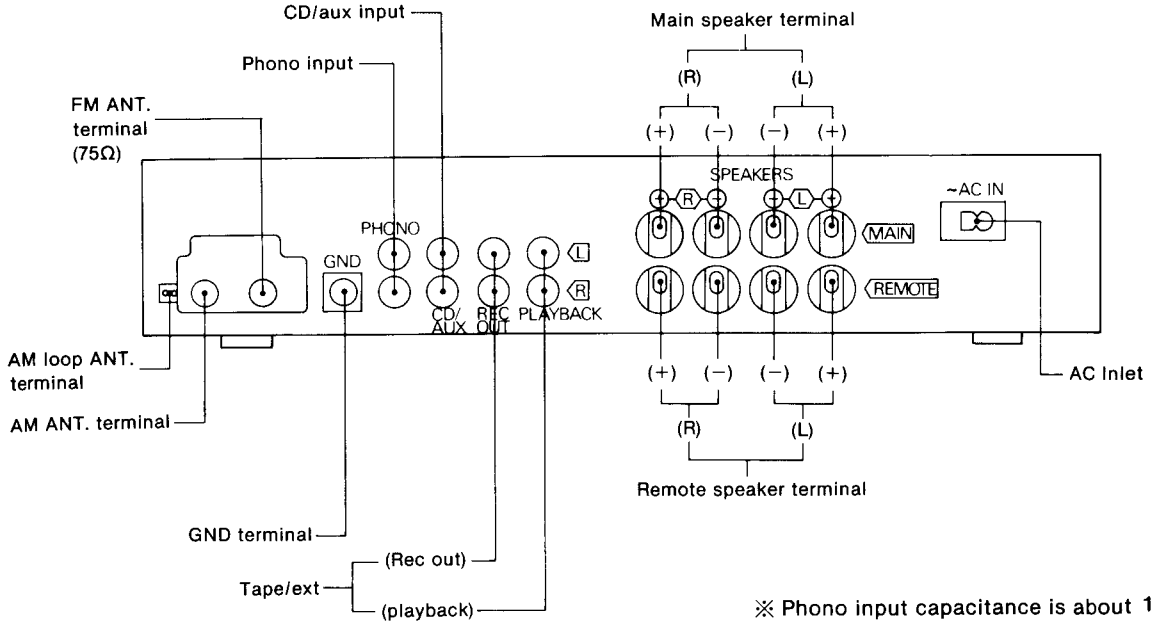
Note:
Specifications are subject to change without notice.
Weight and dimensions shown are approximate.

■ CONTENTS

	page
LOCATION OF CONTROLS	2
ACCESSORIES	3
PROTECTION CIRCUITRY	4
BEFORE REPAIR AND ADJUSTMENT	4
DISASSEMBLY INSTRUCTIONS	4
DESCRIPTION OF LCD PANEL	6
MEASUREMENTS AND ADJUSTMENTS	7
FUNCTION OF TERMINAL (IC901: UPD1718G512)	10
RESISTORS AND CAPACITORS (SA-180L)	11
TERMINAL GUIDE OF IC'S, TRANSISTORS AND DIODES	12
WIRING CONNECTION DIAGRAM	13
PRINTED CIRCUIT BOARDS	15
BLOCK DIAGRAM	21
REPLACEMENT PARTS LIST (SA-180L)	25
SCHEMATIC DIAGRAM	27
REPLACEMENT PARTS LIST • Change of Parts List (SA-180 from SA-180L)	33
EXPLODED VIEW	35

■ LOCATION OF CONTROLS

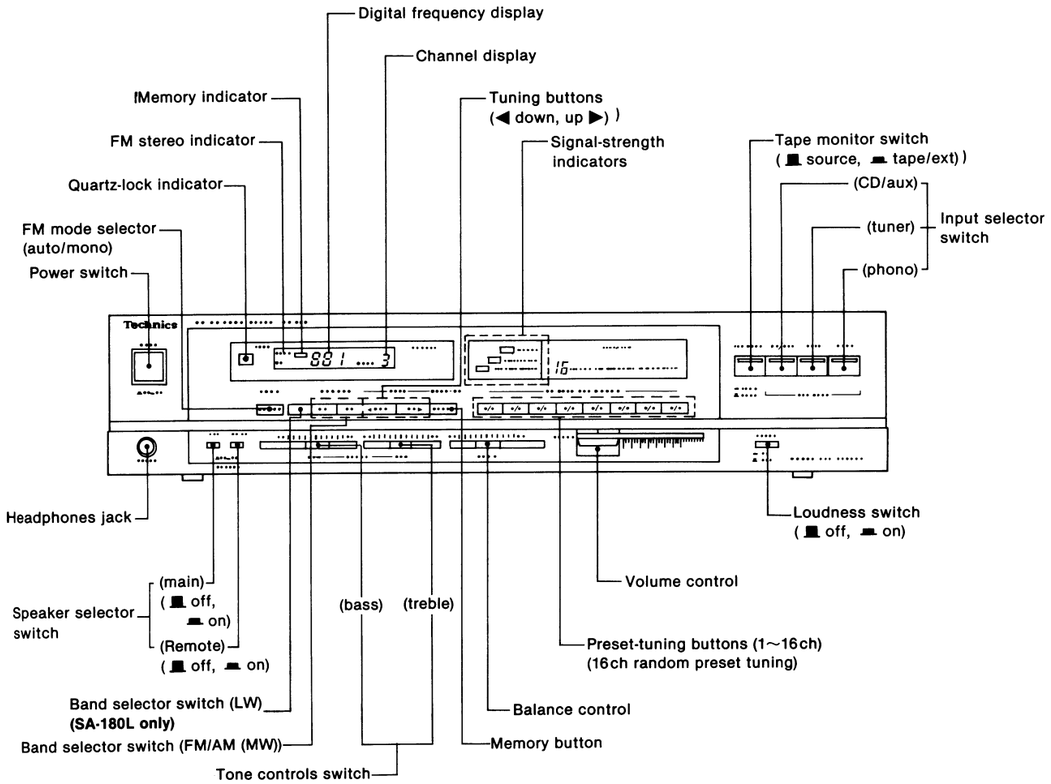
• Rear panel (SA-180/SA-180L)



※ Phono input capacitance is about 100pF.

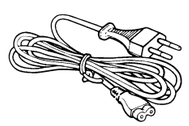
D

• **Front panel (SA-180/SA-180L)**

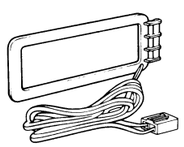


■ ACCESSORIES

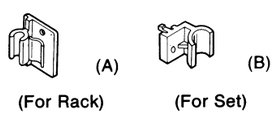
- AC power supply cord 1
  (SFDAC05E02 [EB])
  (SFDAC05E03 [EX, EH, Ei, EW, EF])
  (SFDAC05G02 [EK])



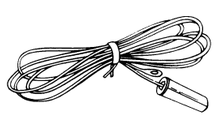
- AM loop antenna 1
  (SSA902-5)



- AM antenna holders 2
  (SMA233-1) (A) (For Rack)
  (SMA231) (B) (For Set)

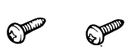


- FM indoor antenna 1
  (SSA270M)



- Attachment plug 1
  (For United Kingdom only)
  (SJP9009)

- Screws 2
  (XTN3+10AFZ)



■ PROTECTION CIRCUITRY

The protection circuitry may have operated if either of the following conditions is noticed:

- No sound is heard when the power is turned on.
- Sound stops during a performance.

The function of this circuitry is to prevent circuitry damage if, for example, the positive and negative speaker connection wires are "shorted", or if speaker systems with an impedance less than the indicated rated impedance of the amplifier are used.

If this occurs, follow the procedure outlined below.

1. Turn off the power.
2. Determine the cause of the problem and correct it.
3. Turn on the power once again.

Note:
When the protection circuitry functions, the unit will not operated unless the power is first turned off and then on again.

■ BEFORE REPAIR AND ADJUSTMENT

1. Turn off the power, Discharge both power supply capacitors (C703, C704 8200μF) through a 10Ω 5W resistor to ground. Do not short between C703 and C704. It may damage the capacitors.
2. After completion of repair, slowly apply the primary voltage by using a variac to avoid over current. Current consumption at 50Hz/60Hz in no signal mode should by shown with respect to supply voltage 220V/240V.

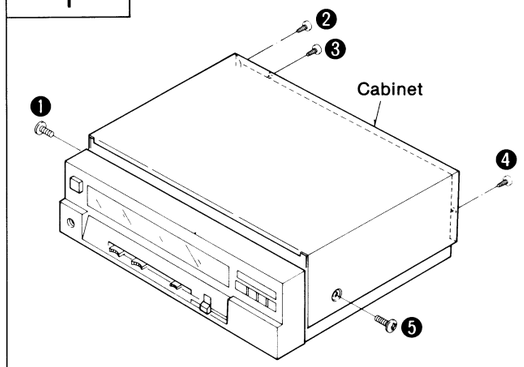
Power supply voltage		220V	240V
Consumed current	50/60Hz	90~230mA	80~220mA

■ DISASSEMBLY INSTRUCTIONS

Ref. No. 1 — **How to remove the cabinet**

Procedure 1

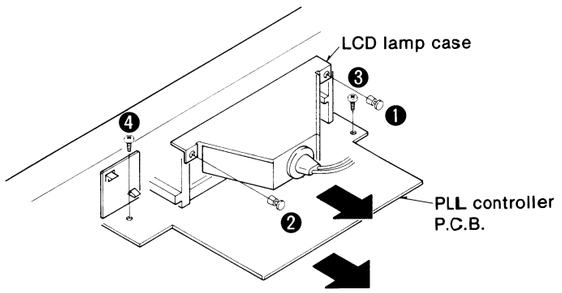
1. Remove the 5 screws (❶~❺).



Ref. No. 3 — **How to remove the PLL controller P.C.B.**

Procedure 1→3

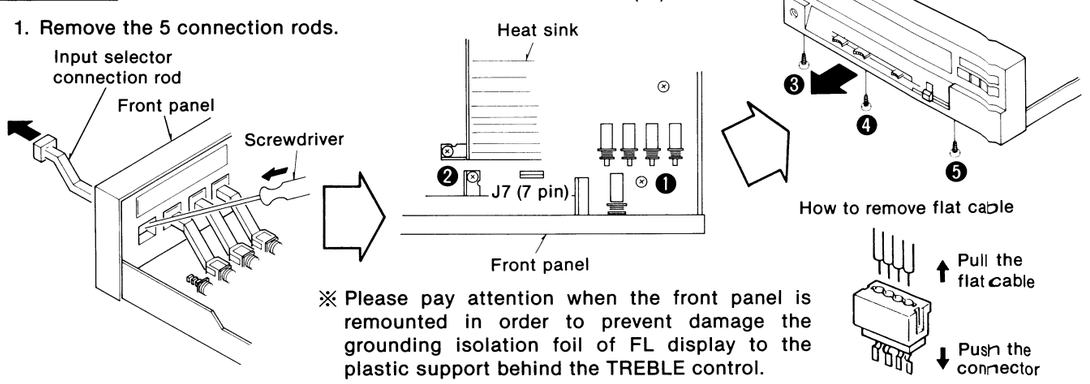
1. Remove the 2 lock pins (❶, ❷) of LCD lamp case.
2. Remove the 2 screws (❸, ❹) of PLL controller P.C.B.



Ref. No. 2 — **How to remove the front panel**

Procedure 1→2

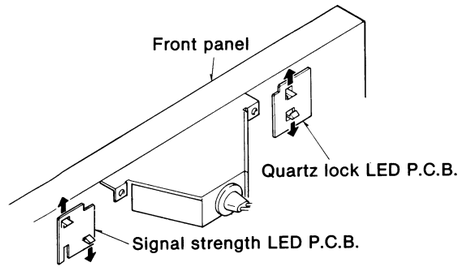
1. Remove the 5 connection rods.
2. Remove the 2 screws (❶, ❷).
3. Pull the 1 connection (J7).
4. Remove the 3 screws (❸~❺).



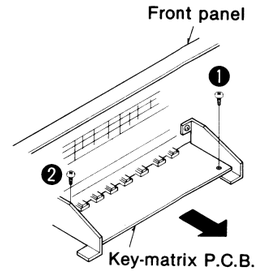
※ Please pay attention when the front panel is remounted in order to prevent damage the grounding isolation foil of FL display to the plastic support behind the TREBLE control.

D

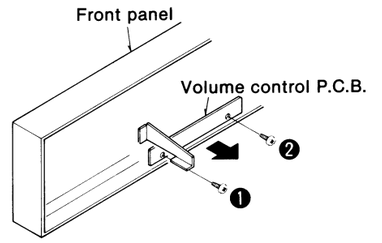
Ref. No. 4	How to remove the quartz lock LED P.C.B. and signal strength LED P.C.B.
Procedure 1 → 2 → 4	1. Remove the 2 tabs of quartz lock LED P.C.B. and signal strength LED P.C.B.

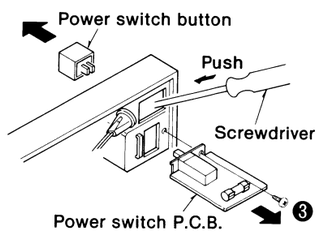


Ref. No. 5	How to remove the key-matrix P.C.B.
Procedure 1 → 2 → 5	1. Remove the 2 screws (❶, ❷) of key-matrix P.C.B.

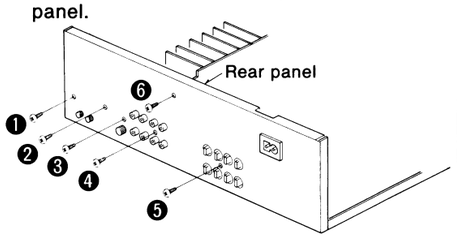


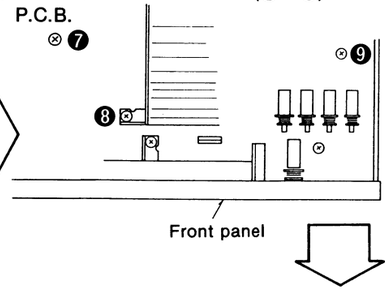
Ref. No. 6	How to remove the volume control P.C.B. and power switch P.C.B.
Procedure 1 → 2 → 6	1. Remove the 2 screws (❶, ❷) of volume control P.C.B. 2. Remove the power switch button and screw (❸) of power switch P.C.B.

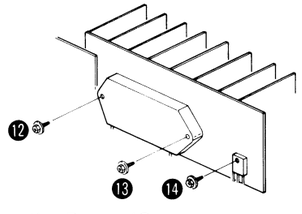


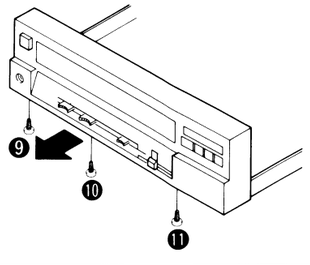


Ref. No. 7	How to remove the power IC and regulator transistor
Procedure 1 → 7	1. Remove the 6 screws (❶~❻) of rear panel. 2. Remove the 3 screws (❼~❾) of main P.C.B. 3. Remove the 3 screws (❾~⓫) of front panel. 4. Unsolder the power IC or regulator transistor. 5. Remove the 3 screws (⓬~⓮).





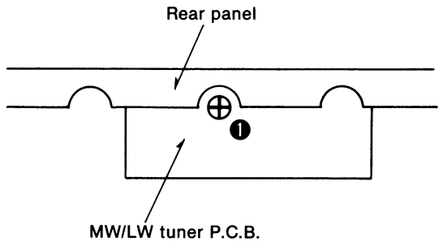




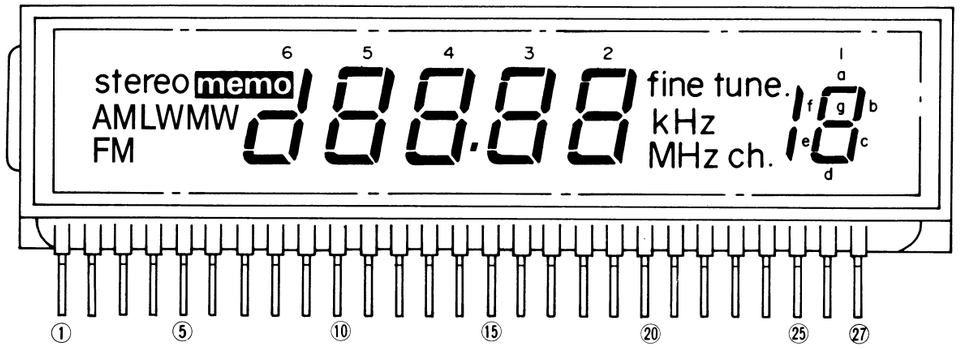
• When mounting the Power IC.
IC apply silicone compond (SZZ0L15) to the rear side of Power IC.

D

Ref. No. 8	How to remove the MW/LW tuner P.C.B. for ST-180L.
Procedure 1→8	1. Remove the 1 screw (❶).



■ DESCRIPTION OF LCD PANEL



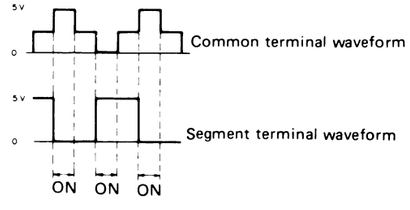
① ⑤ ⑩ ⑮ ⑳ ㉕ ㉗

Common terminal – ①, ② Segment terminal – ③ ~ ㉗

No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
COM 1	COM 1	—	MEMO	—	AM	—	FM,MHz	6b	5f	5e	5d	5a	4f	4e
COM 2	—	COM 2	—	LW	—	MW	6d,e,g	6c	5b	5g	5c	—	4b	4g

No.	15	16	17	18	19	20	21	22	23	24	25	26	27
COM 1	4d	4a	3f	3e	3d	3a	2a,c,d,f	kHz	stereo	ch	1d	1e	1f
COM 2	4c	▰	3b	3g	3c	2b,e	2g	finetune	/	1a	1c	1g	1b

Lighting timing:
It turns on when the difference in voltage between common and segment terminals is 5V (VDD).



■ MEASUREMENTS AND ADJUSTMENTS

■ AM/FM(SA-180)
LW/MW/FM(SA-180L)

Control positions and equipment used

- AM and FM signal generator(AM and FM-SG)
- Stereo modulator
- Distortion analyser
- Oscilloscope
- AC and DC electronic voltmeter(EVM)
- Frequency counter
- Choke coil(100μH)
- Resistor(100kΩ)
- Ceramic capacitor(200pF)

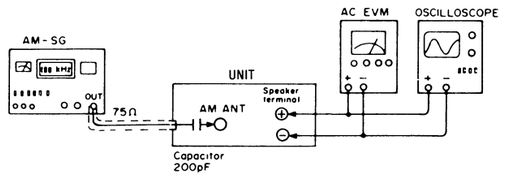
Note: Fro **T201** (AM-IFT) and **L205** (AM OSC coil), adjust parts are supplied. (SA-180)
For **T201** (MW-IFT), **L204** (LW-IFT) and **L205** (MW OSC coil), adjust parts are supplied. (SA-180L)
So, do not turn the cores of the parts.

AM(MW)-RF ADJUSTMENT

1.Test equipment connection is shown in figure.
2.Set the unit to **"AM(MW)"** position.
3.Place the radio dial and signal generator setting to **610kHz**.
4.Adjust **L204** for maximum output. **(SA-180)**
4.Adjust **L203** for maximum output. **(SA-180L)**
5.Place the radio dial and signal generator setting to **1500kHz**.
6.Adjust **CT201** for maximum output.
7.Repeat steps 3.~ 6.

Note: Antenna input level must be as low as possible being free from AGC.

AM SIGNAL GENERATOR CONDITION
Modulation 30%
Modulation frequency 400Hz

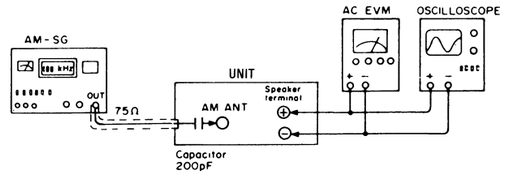


LW-RF ADJUSTMENT (SA-180L only)

1.Test equipment connection is shown in figure.
2.Set the unit to **"LW"** mode.
3.Place the radio frequency display and signal generator setting to **155kHz**.
4.Adjust **L206** for maximum output.
5.Place the radio frequency display and signal generator setting to **353kHz**.
6.Adjust **CT202** for maximum output.
7.Repeat steps 3.~ 6.

Note: Antenna input level must be as low as possible being free from AGC.

AM SIGNAL GENERATOR CONDITION
Modulation 30%
Modulation frequency 400Hz

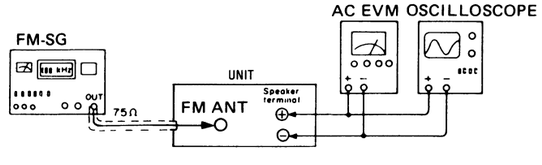


FM-RF ADJUSTMENT

1.Test equipment connection is shown in figure.
2.Place unit into **"FM"** position.
3.Place the radio dial and signal generator setting to **90.10MHz**.
4.Adjust **L106** for maximum output.
5.Place the radio dial and signal generator setting to **106.10MHz**.
6.Adjust **CT101** for maximum output.
7.Repeat steps 3 ~ 6.

Note: As three output reading will be present, adjustments must be made at center frequency.

FM SIGNAL GENERATOR CONDITION
Modulation 100%
Modulation frequency 400Hz
Output level.....66dB

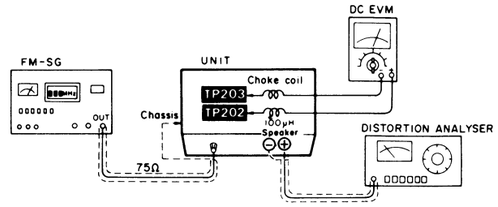


FM MONO DISTORTION ADJUSTMENT

1.Test equipment connection is shown in figure.
2.Set the unit to **"FM"** position.
3.Place the radio frequency display and signal generator setting to **100.10MHz**.
4.Adjust **T202** core so that voltage measured in signal mode is **0mV(0±20mV)** in 300mV range. **(SA-180)**
4.Adjust **T203** so that the distortion factor of Lch is minimized. **(SA-180L)**
5.Repeat steps 4 and 5 a few times.
6.Make sure that the distortion factors of L-CH and R-CH are nearly the same with each other to minimum.

Note: The adjusting screwdriver used should be made of resin.

FM SIGNAL GENERATOR CONDITION
Modulation 100%
Modulation frequency 400Hz
Output level.....72dB



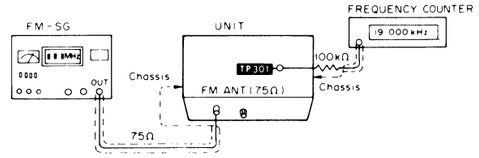
MPX VCO ADJUSTMENT (FREE RUN)

1.Test equipment connection is shown in figure.
2.Place unit into **"FM auto"** position.
3.Place the radio dial and signal **generator** setting to **100.10MHz**.
4.Adjust **VR301** for **19kHz±30Hz** on frequency counter reading.
5.Tune a stereo broadcast and confirm the frequency stays at 19kHz.

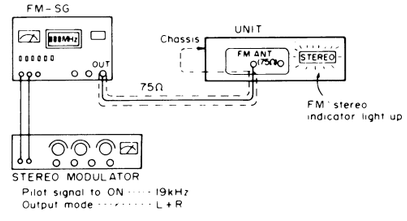
USING ALTERNATE SYSTEM

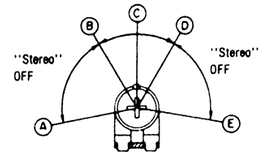
1.Apply stereo signal from generator or receive the stereo broadcast.
2.Adjust **VR301** until stereo indicator lights up. Fix the arm of **VR301** as shown in figure.

FM SIGNAL GENERATOR CONDITION
Modulation 0%
Modulation frequency 0Hz
Output level.....66dB



FM SIGNAL GENERATOR CONDITION
Modulation 10%
Modulation frequency .....Pilot (19kHz)
Output level.....66dB



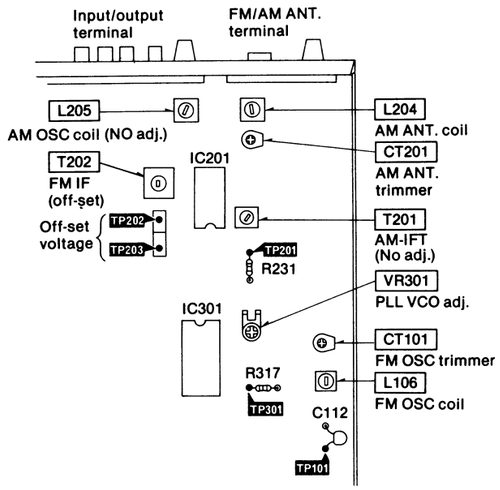


VR301

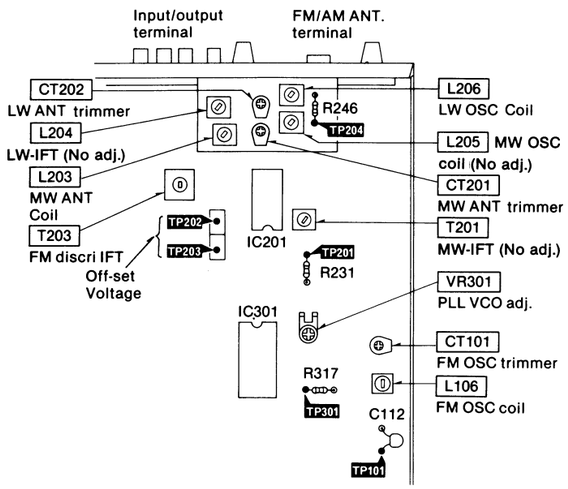
Ⓐ−Ⓑ,
Ⓓ−Ⓔ..... "Stereo" OFF position
Ⓑ−Ⓓ..... "Stereo" ON position (Indicator lighting)
Ⓒ..... Adjust point of pilot circuit

• Adjustment point

(SA-180)



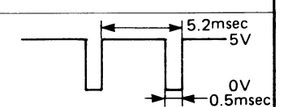
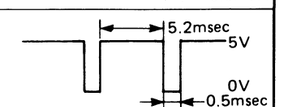
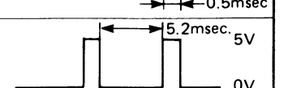
(SA-180L)



D

■ FUNCTION OF TERMINAL (IC901: UPD1718G512)

• PLL CONTROLLER IC

Pin No.	Mark	Description of terminal
1 ∫ 4 34 ∫ 52	LCD4 ∫ LCD1 LCD23 ∫ LCD5	Segment signal output terminal for display.
5	COM2	Common signal output terminal connected to LCD. Output is delivered in 3 values of earth, 1/2VDD and VDD (at 5 ms intervals) in a period of 50 Hz. The segment turns ON when the difference in voltage is ± VDD between these terminals and LCD1 ~ LCD23.
6	COM1	
7	VDD	Power supply terminal of device. Voltage of 5V ± 10% is supplied during operation of device. To hold the internal data memory (RAM), the voltage can be decreased to 2.5V. **Note:** Pins 7 and 33 are connected inside the chip. So, it is unnecessary to supply voltage to the pins.
8	FM	Input is local oscillation output (VCO) in a range of 10 ~ 130 MHz (0.3Vp-p, min.). There are 1/2 fixed frequency division prescaler and 2-step (1/32, 1/33) prescaler internally. Therefore, when deciding the frequency dividing value of programmable divider, it must be decided from the frequency obtained by halving the local oscillation output (VCO).
9	AM	Input is local oscillation output (VCO) in a range of 0.5 ~ 20 MHz (0.1Vp-p, min.). When the mode is shifted to FM, the AM terminal voltage automatically becomes the supply voltage of device.
10	GND	Ground terminal.
11	E01	When the divided oscillation frequency is higher than the standard frequency, H-level output is delivered from these terminals. When it is lower, L-level (0V) output is delivered. When they coincide, it results in floating.
12	E02	
13	CE	Device selection signal input terminal. The signal level should be high when the device is operated, and low when not operated. With this terminal shifted to low level, LCD (liquid crystal display) turns off and the memory is held.
14	NC	Not used in this unit.
15	X1	Connecting terminal for crystal oscillator. The crystal connected is at 4.5 MHz.
16	X2	
17	A3 (SD)	Terminal to put in stop signal during auto tuning. The voltage is 5V with broadcast received, and 0V without broadcast received.
18	A2	Not used in this unit.
19	A1	FM/AM output terminal. (FM ⟶ 5V, AM ⟶ 0V)
20	A0	Auto/mono changeover output terminal. (auto ⟶ 0V, mono ⟶ 5V) LW changeover output terminal (MW→0V, LW→5V)
21 (24	K3 (K0	Input terminal for key return signal from external key matrix. 
25 ∫ 28	B3 ∫ B0	Output terminal for key return signal from external key matrix. 
29	C3	Output terminal for key return signal to let the stereo indicator light up. 
30	C2	AF output signal detection terminal. When AF output is higher than AC 2V, Q904 turns ON and key return signal is put into No. 24 pin.
31	C1	FM/AM output terminal .
32	C0	Muting signal output terminal. Muting signal is put out during operation of FM/AM selector switch and tuning switch. (4V during muting)

■ RESISTORS & CAPACITORS (SA-180L)

Numbering System of Resistor

Example:

ERD	25	F	J	101
Type	Wattage	Shape	Tolerance	Value (100Ω)

ERJ	6G	C	J	2R2
Type	Wattage	Shape	Tolerance	Value (2.2Ω)

Numbering System of Capacitor

Example:

ECKD	1H	102	Z	F
Type	Voltage	Value (1000pF)	Tolerance	Peculiarity

ECEA	50	M	R47
Type	Voltage	Peculiarity	Value (0.47μF)

Resistor Type		Wattage	Tolerance
ERD:	Carbon Resistor	10 : 1/8W	F : ±1%
ERC:	Solid Resistor	25 : 1/4W	G : ±2%
ERF:	Incombustible Box-Shaped Wire-Wound Resistor	50 : 1/2W	J : ±5%
		18 : 1/8W	K : ±10%
		14 : 1/4W	M : ±20%
		12 : 1/2W	
ERG:	Metal Oxide-Film Resistor	1 : 1W	
		2 : 2W	
ERM:	Wire-Wound Resistor	3 : 3W	
		S1 : 1/2W	
ERO:	Superstable Metal Film Resistor	S2 : 1/4W	
		6G : 1/10W	
		8G : 1/8W	
ERX:	Metal-Film Resistor		
RRJ: ERJ:	Chip Resistor		

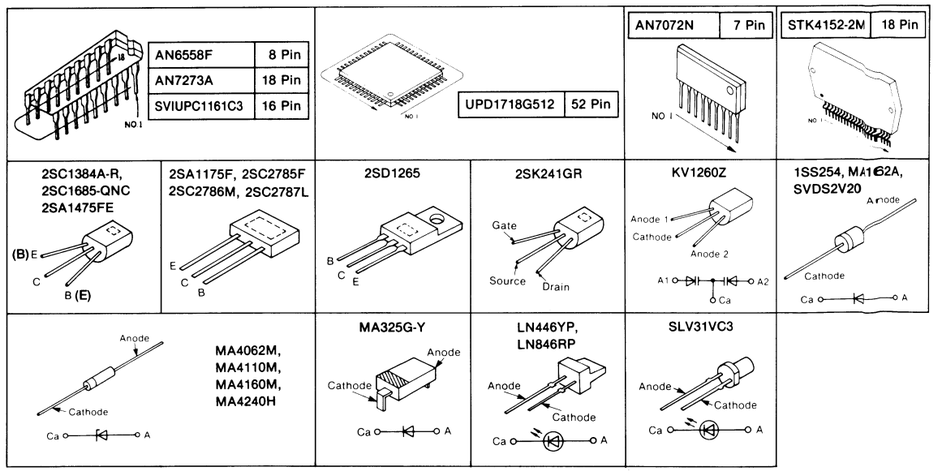
※ Capacity are in microfarads (μF) unless specified otherwise, P=Pico-farads.
※ Resistance are in ohms (Ω), unless specified otherwise, 1K=1,000Ω, 1M=1,000KΩ

Capacitor Type		Voltage	Tolerance
ECCD:	Ceramic Capacitor (Chitacon)	(ECCD, ECKD Type) 1H : 50V DC 2H : 500V DC	K : ±10%
ECKD:	Ceramic Capacitor (Chitabari)	(ECFD Type) C : 12V DC D : 25V DC	M : ±20%
ECFD:	Semiconductor Ceramic Capacitor	E : 50V DC	Z : +80% −20%
ECE□:	Electrolytic Capacitor	(ECQ Type) 05 : 50WV DC 1 : 100WV DC	J : ±5%
ECS□:	Tantalum Fixed Electrolytic Capacitor	(ECE, ECS Type) 0G : 4V 0J : 6.3V 1A : 10V 1C : 16V 1E : 25V 1V : 35V 1H : 50V 1J : 63V 2A : 100V	G : ±2% F : ±1% C : ±0.25pF D : ±0.5pF
ECQ□:	Polystyrenc Film Capacitor		
ECQS:	Polystyrene Film Capacitor		
ECQS:	Polypropylene Film Capacitor		
ECQV:	T.F Capacitor		
ECU□: RCU□:	Chip Capacitor		
ECBT:	Cylindrical Ceramic Capacitor		

Ref. No.	Part No.
RESISTORS	
R1, R2	ERDS2TJ391
R3, R4	ERDS2TJ224
R5, R6	ERDS2TKG5622
R7, R8	ERDS2TJ271
R9, R10	ERDS2TJ680
R11, R12	ERDS2TJ184
R13, R14	ERDS2TJ123
R15, R16	ERDS2TJ563
R17, R18	ERDS2TJ102
R102	ERDS2TJ102
R103	ERDS2TJ151
R104	ERDS2TJ471
R105	ERDS2TJ333
R107	ERDS2TJ474
R110	ERDS2TJ221
R111	ERDS2TJ391
R112	ERDS2TJ221
R113	ERDS2TJ223
R114	ERDS2TJ103
R115	ERDS2TJ222
R118	ERDS2TJ104
R119	ERDS2TJ332
R120	ERDS2TJ331
R121	ERDS2TJ562
R201	ERDS2TJ103
R202	ERDS2TJ182
R203	ERDS2TJ223
R204	ERDS2TJ822
R205	ERDS2TJ104
R206	ERDS2TJ473
R207	ERDS2TJ102
R208	ERDS2TJ563
R209	ERDS2TJ182
R210	ERDS2TJ121
R211	ERDS2TJ101
R212	ERDS2TJ561
R213	ERDS2TJ151
R214	ERDS2TJ471
R215	ERDS2TJ223
R216	ERDS2TJ563
R217	ERDS2TJ471
R218	ERDS2TJ822
R219	ERDS2TJ104
R220	ERDS2TJ153
R221, R222	ERDS2TJ122
R223	ERDS2TJ473
R224, R225	ERDS2TJ103
R228	ERDS2TJ474
R229	ERDS2TJ331
R230	ERDS2TJ824
R231	ERDS2TJ471
R232	ERDS2TJ273
R234, R235	ERDS2TJ104
R236	ERDS2TJ103
R239	ERDS2TJ334
R240	ERDS2TJ102
R241	ERDS2TJ471
R242	ERDS2TJ123
R243	ERDS2TJ222
R244	ERDS2TJ151
R246	ERDS2TJ102
R248	ERDS2TJ471
R249	ERDS2TJ153
R250	ERDS2TJ562
R251	ERDS2TJ221
R252	ERDS2TJ104
R301 (EK)	ERDS1FJ221
R301 (EW, EF, EB)	ERDS2TJ221
R304, R305	ERDS2TJ223
R306	ERDS2TJ334
R307, R308	ERDS2TJ332
R309, R310	ERDS2TJ104
R313	ERDS2TJ153
R314	ERDS2TJ123
R315	ERDS2TJ102
R317, R318	ERDS2TJ103
R507, R508	ERDS2TJ222
R509, R510	ERDS2TJ561
R511, R512	ERDS2TJ183
R513, R514	ERDS2TJ222
R515, R516	ERDS2TJ124
R517, R518	ERDS2TJ393
R519, R520	ERDS2TJ222
R521, R522	ERDS2TJ183
R601, R602	ERDS2TJ102
R603, R604	ERDS2TJ563
R607, R608	ERDS2TJ123
R609, R610	ERDS2TJ473
R613, R614	ERDS2TJ222
R615, R616	ERDS2TJ272
R621, R622	ERDS2TJ102
R625, R626	ERDS1FJ100
R627, R628	ERDS1FJ331
R629	ERD25FJ470
R630	ERDS1FJ391
R633	ERD25FJ1R0
R634	ERD25FJ820
R634 (EW, EF, EB)	ERQ12HJ820
R634 (EK)	ERDS1FJ221
R635	ERD25FJ1R0
R636	ERDS2TJ560
R700 (EK)	ERX1ANJR27
R701, R702	ERD25FJ181
R703	ERDS2TJ393
R704, R705	ERX2ANJ220
R706	ERDS1FJ152
R707	ERDS2TJ821
R708	ERDS2TJ102
R709	ERDS2TJ272
R710	ERDS2TJ222
R711	ERDS1FJ152
R712	ERDS1FJ821
R712 (EW, EF, EB)	ERDS2TJ221
R712 (EK)	ERD25FJ470
R713	ERDS1FJ681
R714	
R720 (EK)	ERDS2TJ103
R901	ERDS2TJ561
R903	ERDS2TJ153
R904	ERDS2TJ332
R906	

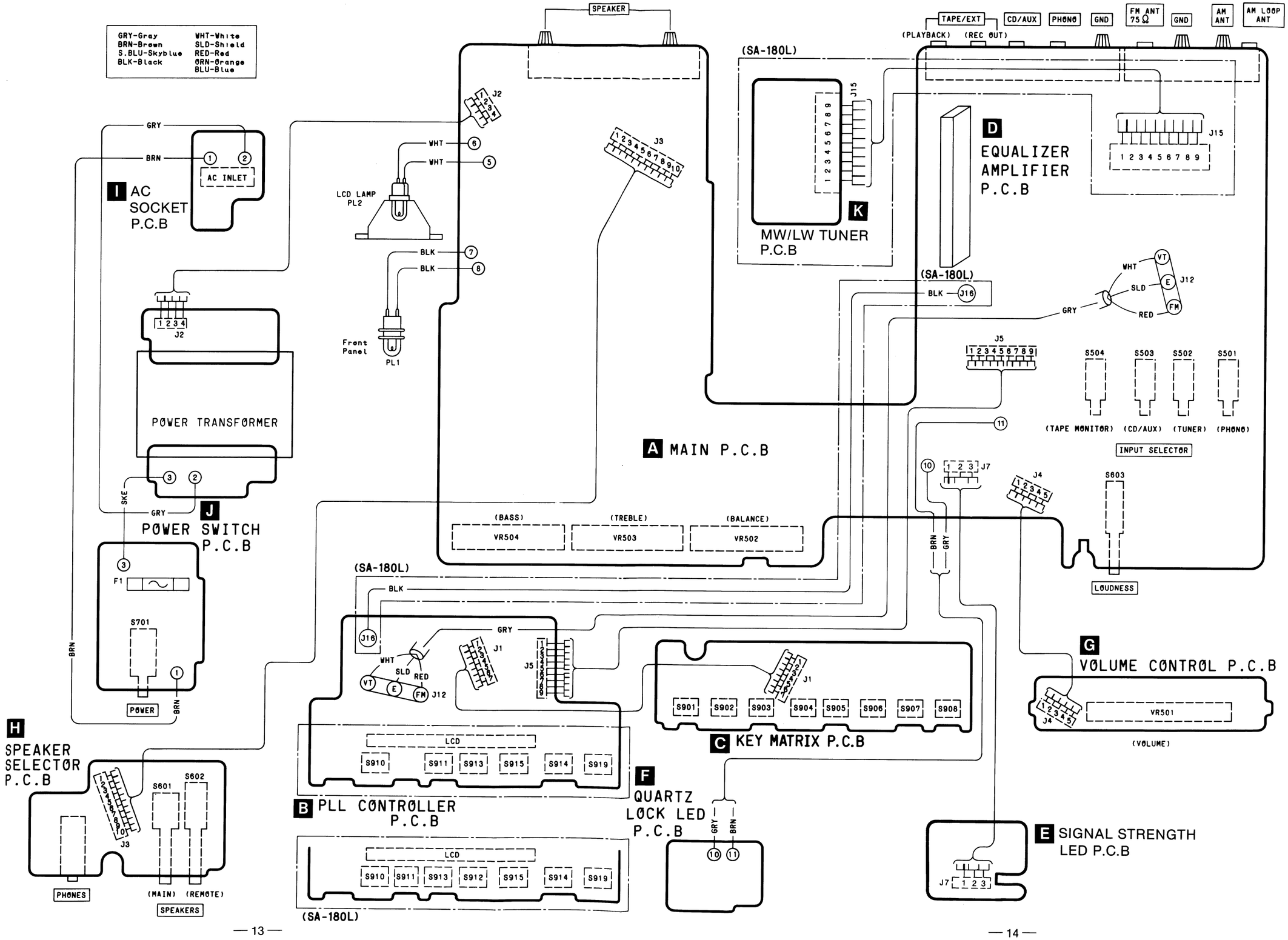
Ref. No.	Part No.
R907	ERDS2TJ473
R908	ERDS2TJ103
R909	ERDS2TJ562
R910	ERDS2TJ681
R911, R912	ERDS2TJ102
R921	ERDS2TJ221
R922	ERDS2TJ101
CAPACITORS	
C1, C2	ECEA1HU3R3
C3, C4	RCBS1H101KBY
C5, C6	ECKD1H102KB
C7, C8	ECQM1H223JZ
C9, C10	ECQM1H682JZ
C11, C12	ECEA1HU010
C13, C14	ECEA0JU330
C104	RCBS1H180JCY
C106	RCBS1H220JCY
C107, C108	RCBS1H102KBY
C109	RCBS1H4R7KCY
C110	RCBS1H121KBY
C111	RCBS1H1R8MCY
C115	RCBS1H180JCY
C116	RCBS1H181KBY
C118, C119	ECKD1H103PF
C120	RCBS1H102KBY
C121	RCBS1H6R8KCY
C122	ECKD1H223PF
C123	RCBS1H390JLY
C125 (EW, EF, EB)	RCBS1H100JCY
C125 (EK)	RCBS1H6R8KCY
C126 (EW, EF, EB)	RCBS1H1R8MCY
C126 (EK)	RCBS1H2R7KCY
C127	RCBS1H102KBY
C128	RCBS1H180JCY
C129	RCBS1H1R0MCY
C130	RCBS1H102KBY
C140 (EW, EF, EB)	ECBS1C103NYY
C140 (EK)	ECKD1H103PF
C141	ECKD1H103PF
C201	ECQM1H473JZ
C202	ECCD1H180KC
C203	ECQP1471JZ
C204	ECQP1391JZ
C205	ECEA1HU3R3
C206	ECKD1H223PF
C208	ECKD1H103PF
C209	ECCD1H470K
C211	ECKD1H223PF
C212	ECCD1H080CC
C213	ECCD1H470K
C214	ECEA0JU101
C215	ECEA1HU4R7
C216	ECKD1H103PF
C217	ECKD1H223PF
C218	ECFTD183KXL
C219	ECEA1HU2R2
C220	ECEA1HU4R7
C222	ECEA1CU100
C223	ECEA1HU010
C224	ECKD1H103PF
C225	ECEA1CU100
C226	ECKD1H331KB
C227	ECKD1H223PF
C229	ECKD1H103PF
C231	ECCD1H220K
C232	ECEA1CU100
C301	ECEA1CU101
C304, C305	ECEA1HUR47
C306, C307	ECFTD153KXL
C310	ECQP1471JZ
C311	ECEA1HU010
C312	ECFTD473KXL
C313	ECEA1HU3R3
C314	ECEA1HUR47
C315, C407	ECKD1H103PF
C408	ECKD1H103PF
C513, C514	ECFTD332KXL
C515, C516	ECFTD223KXL
C517, C518	ECFTD183KXL
C519, C520	ECFTD104KXL
C521, C522	ECFTD563KXL
C523, C524	ECKD1H331KB
C601, C602	ECEA1HN4R7S
C603, C604	ECCD1H101K
C605, C606	ECCD1H101K
C607, C608	ECEA1HS330
C609, C610	ECCD1H050CC
C611, C612	ECEA1HN3R3S
C615	ECEA1HU100
C617	ECEA1HS330
C618	ECEA1JU220
C619 (EK)	ECFTD104KXL
C619 (EW, EF, EB)	ECKD1H473ZF
C620 (EK)	ECFTD104KXL
C620	ECKD1H473ZF
C621, C622 (EK)	ECFTD104KXL
C623, C624	ECEA1CN100S
C701 ⚠	ECKDKC103PF2
C702	ECQE1104KN
C703, C704	ECETS45V472U
C705	ECEA0JU470
C707	ECEA1HU470
C708	ECEA1VU4R7
C709	ECEA1VU470
C710	ECKD1H103PF
C711	ECEA1AU101
C712, C713	ECKD1H103PF
C714	ECKD1H103PF
C715	ECEA1EU101
C717	ECKD1H223PF
C901	ECEA25M4R7R
C902	ECKD1H103PF
C903	ECEA1HU010
C904	ECKD1H223PF
C906	ECCD1H470K
C907	ECCD1H100KC
C908	EECF5R5U473
C910	ECEA0JU471
C913	ECKD1H103PF
C914	ECCD1H150KC
C915	ECEA1HU3R3
C916	ECEA1HU010
C918	ECCD1H121K
C921	ECEA1CU221
C922	ECKD1H103PF
C930	ECEA1HU010

■ TERMINAL GUIDE OF IC'S, TRANSISTORS AND DIODES



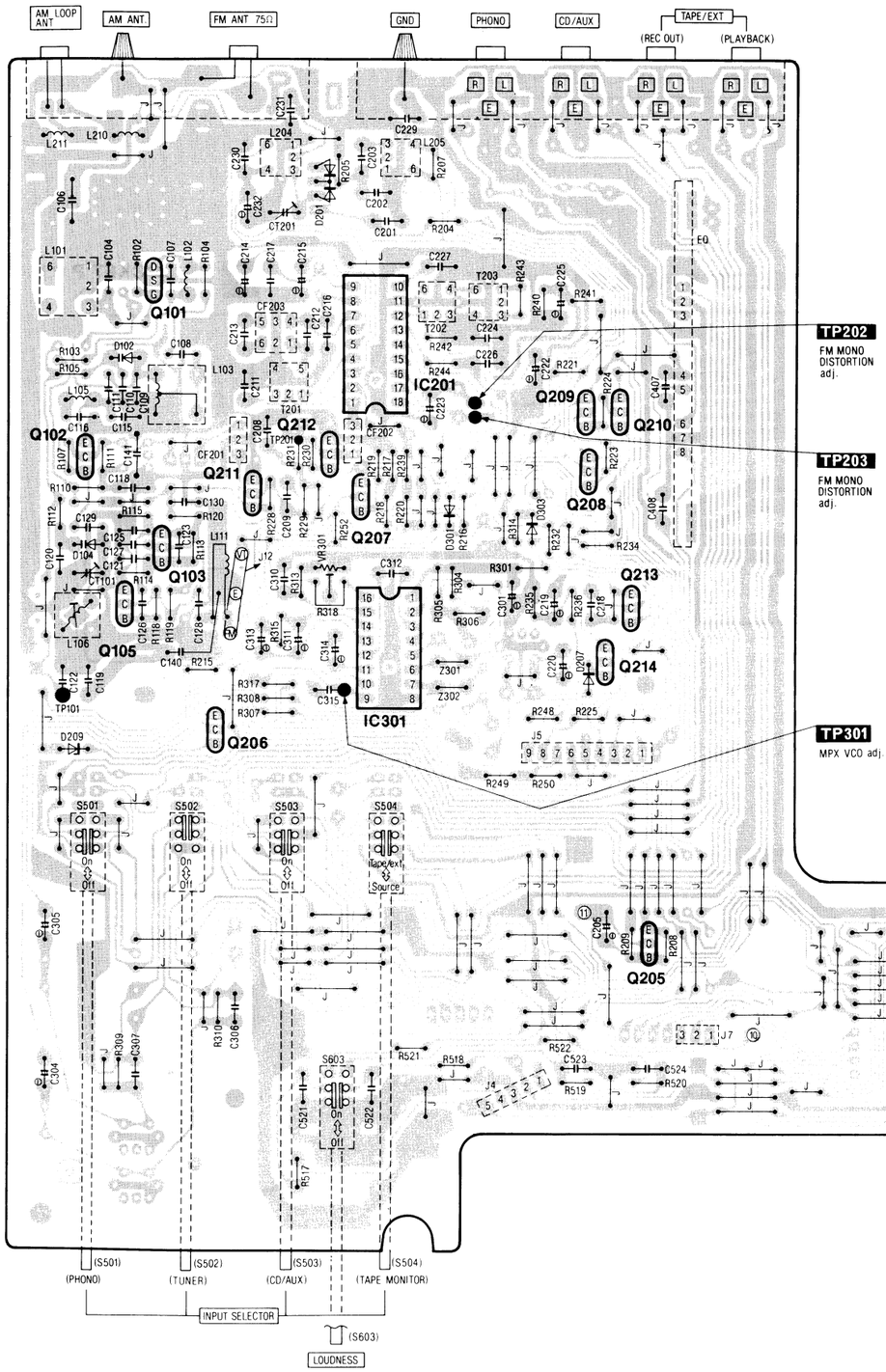
D

■ WIRING CONNECTION DIAGRAM

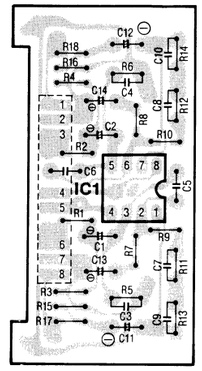


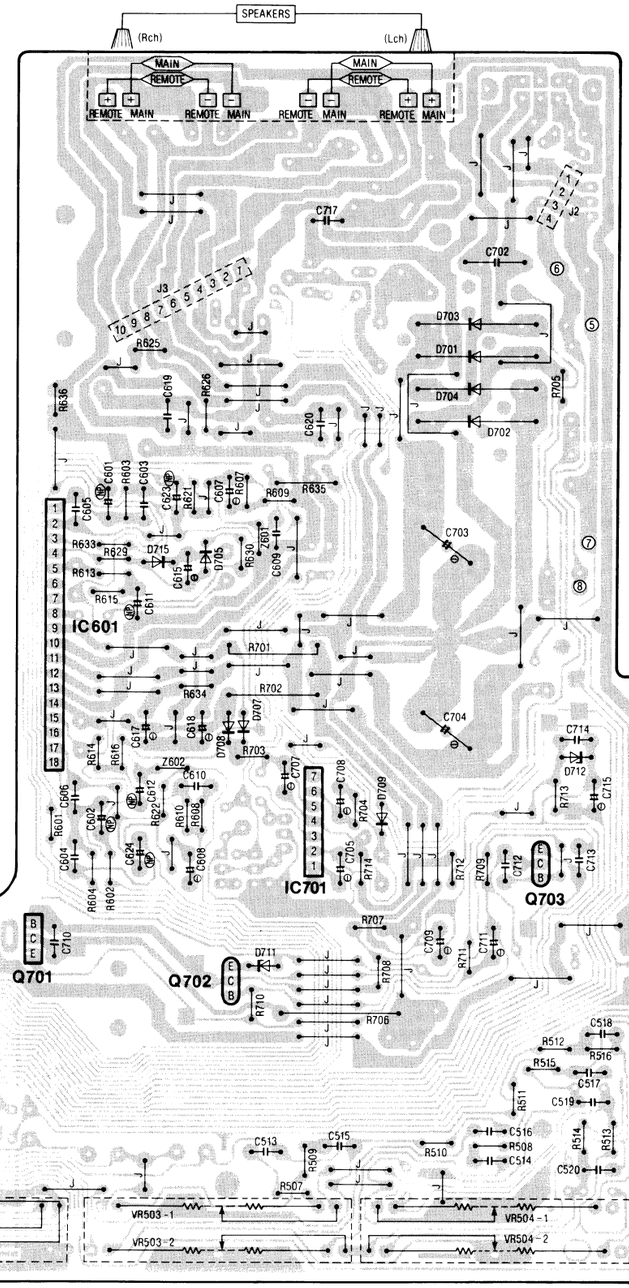
■ PRINTED CIRCUIT BOARDS

A MAIN P.C.B. (SA-180)

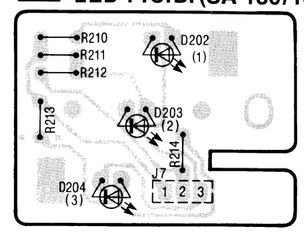


D EQUALIZER AMPLIFIER P.C.B. (SA-180/180L)

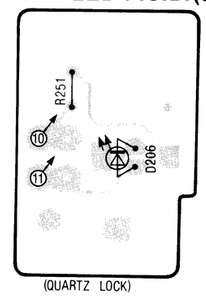




E SIGNAL STRENGTH LED P.C.B. (SA-180/180L)



F QUARTZ LOCK LED P.C.B. (SA-180/180L)



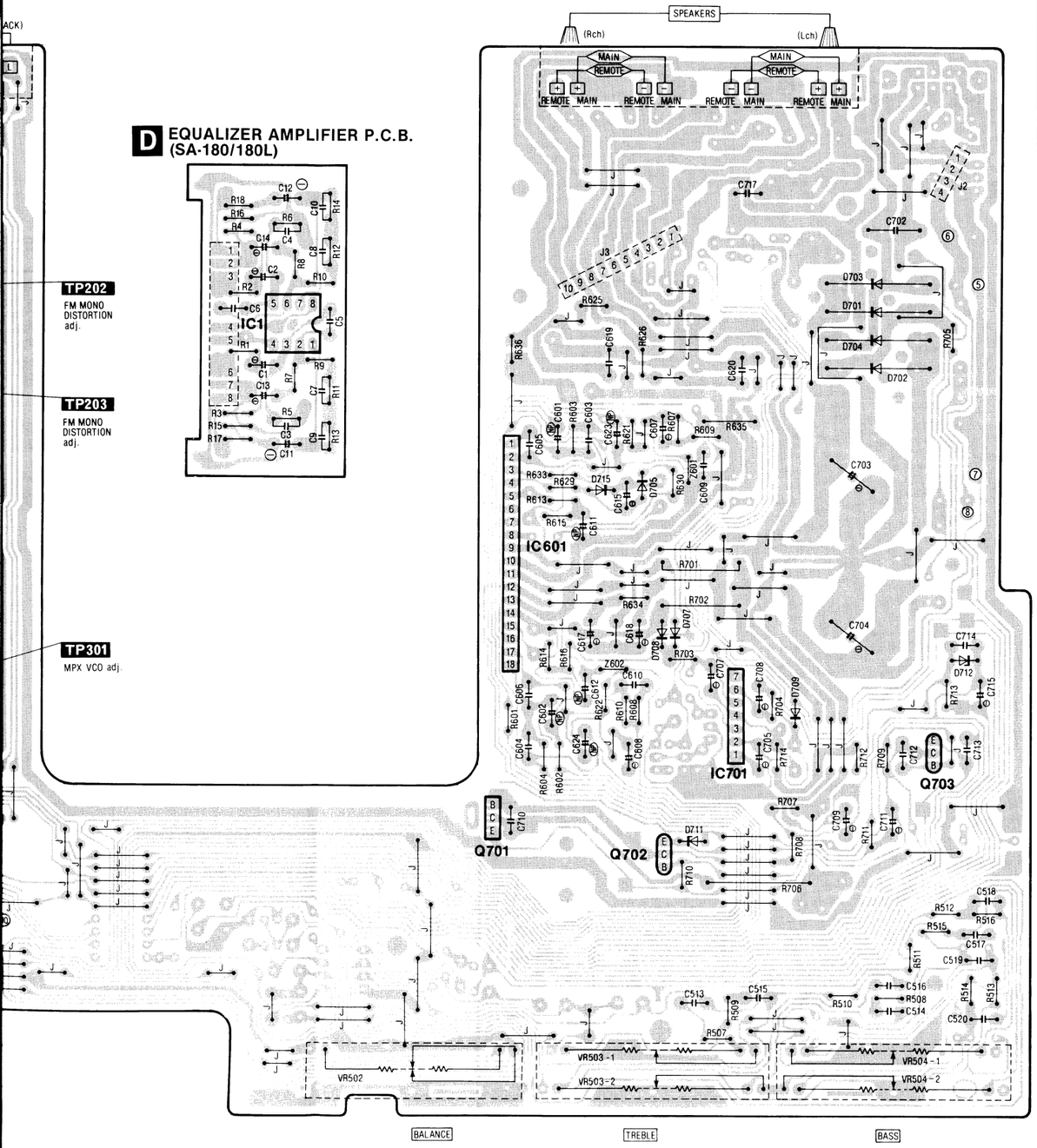
(QUARTZ LOCK)

D EQUALIZER AMPLIFIER P.C.B. (SA-180/180L)

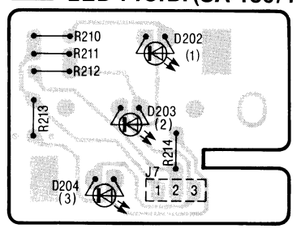
TP202
FM MONO DISTORTION adj.

TP203
FM MONO DISTORTION adj.

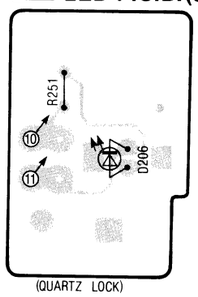
TP301
MPX VCO adj.



E SIGNAL STRENGTH LED P.C.B. (SA-180/180L)

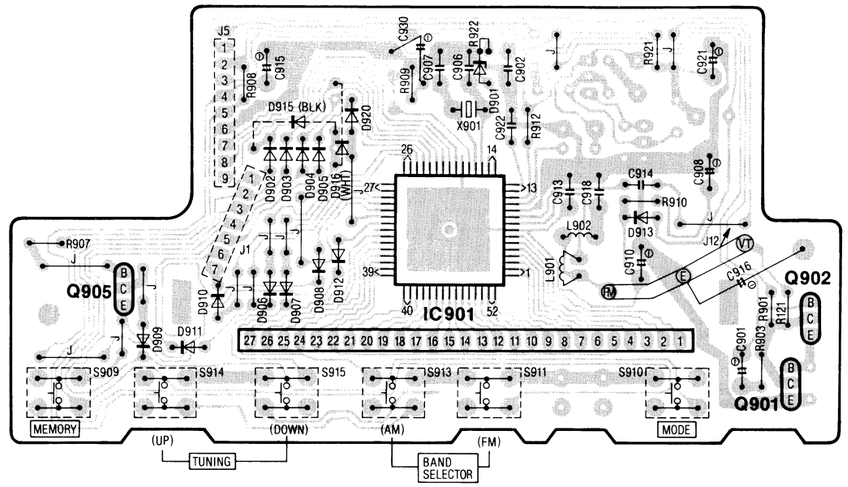


F QUARTZ LOCK LED P.C.B. (SA-180 /180L)

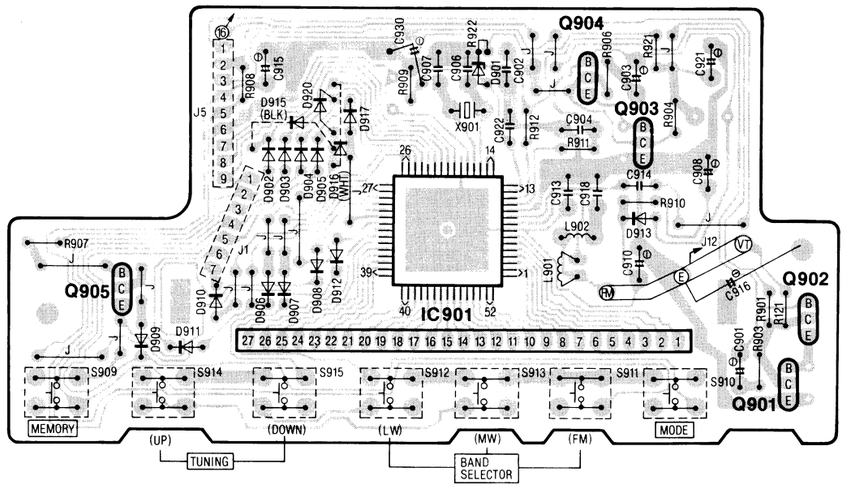


(QUARTZ LOCK)

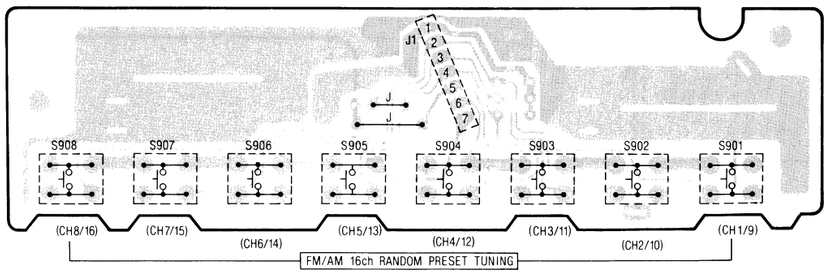
B PLL CONTROLLER P.C.B. (SA-180)



B PLL CONTROLLER P.C.B. (SA-180L)

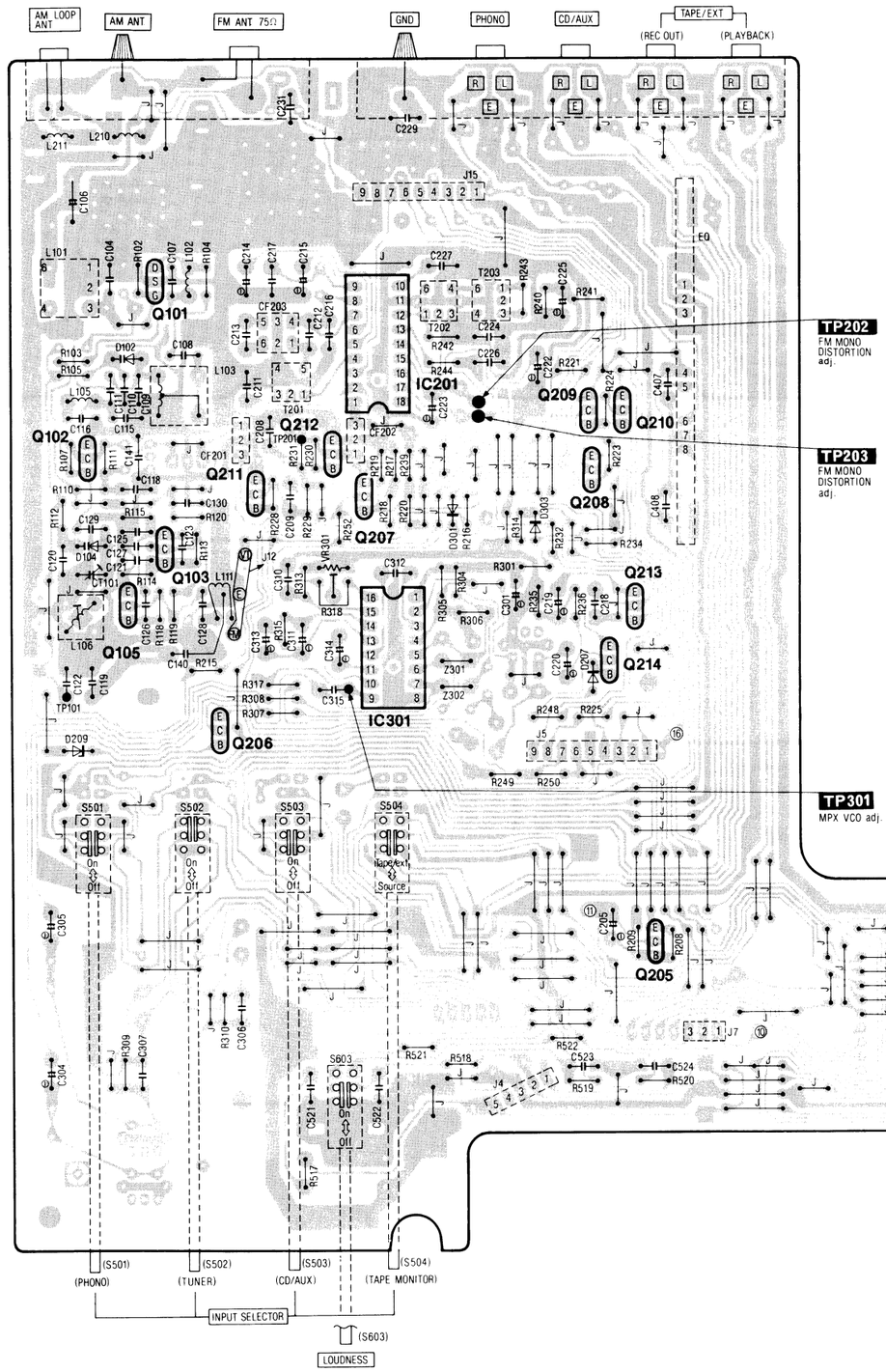


C KEY-MATRIX P.C.B. (SA-180/180L)

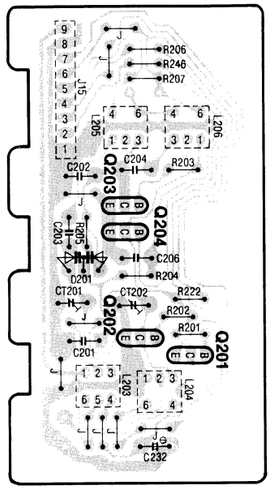


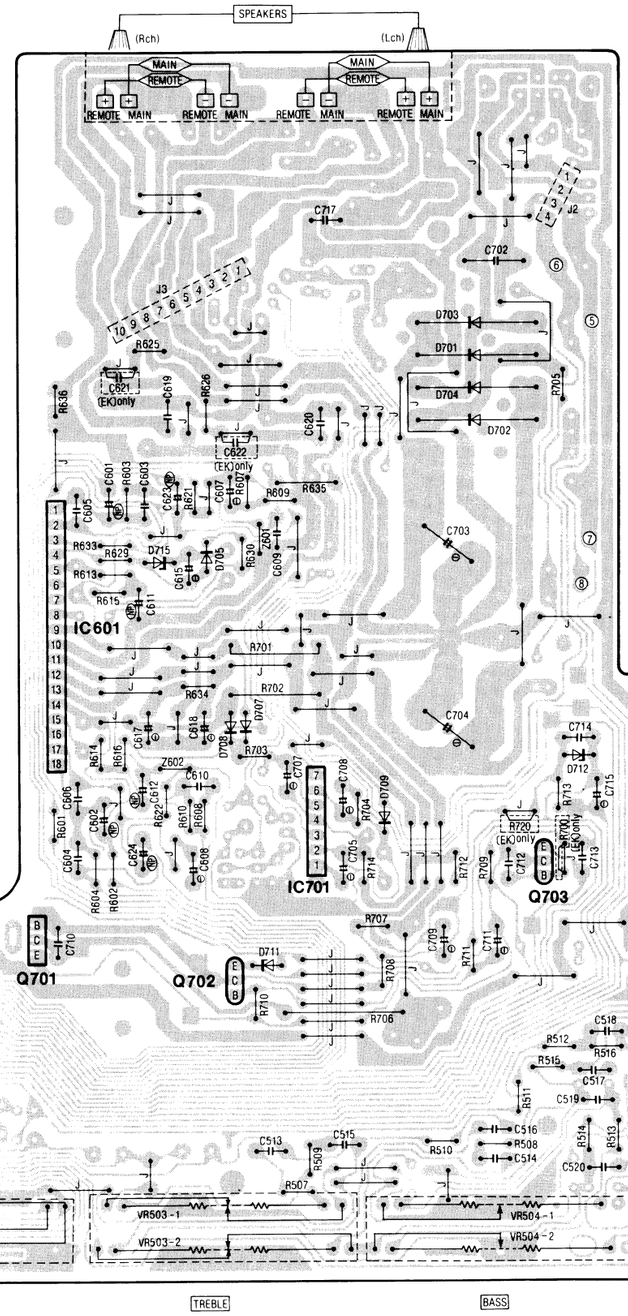
■ PRINTED CIRCUIT BOARDS

A MAIN P.C.B. (SA-180L)



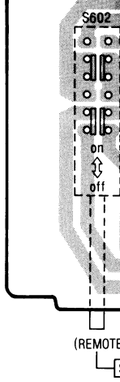
K MW/LW TUNER P.C.B. (SA-180L)

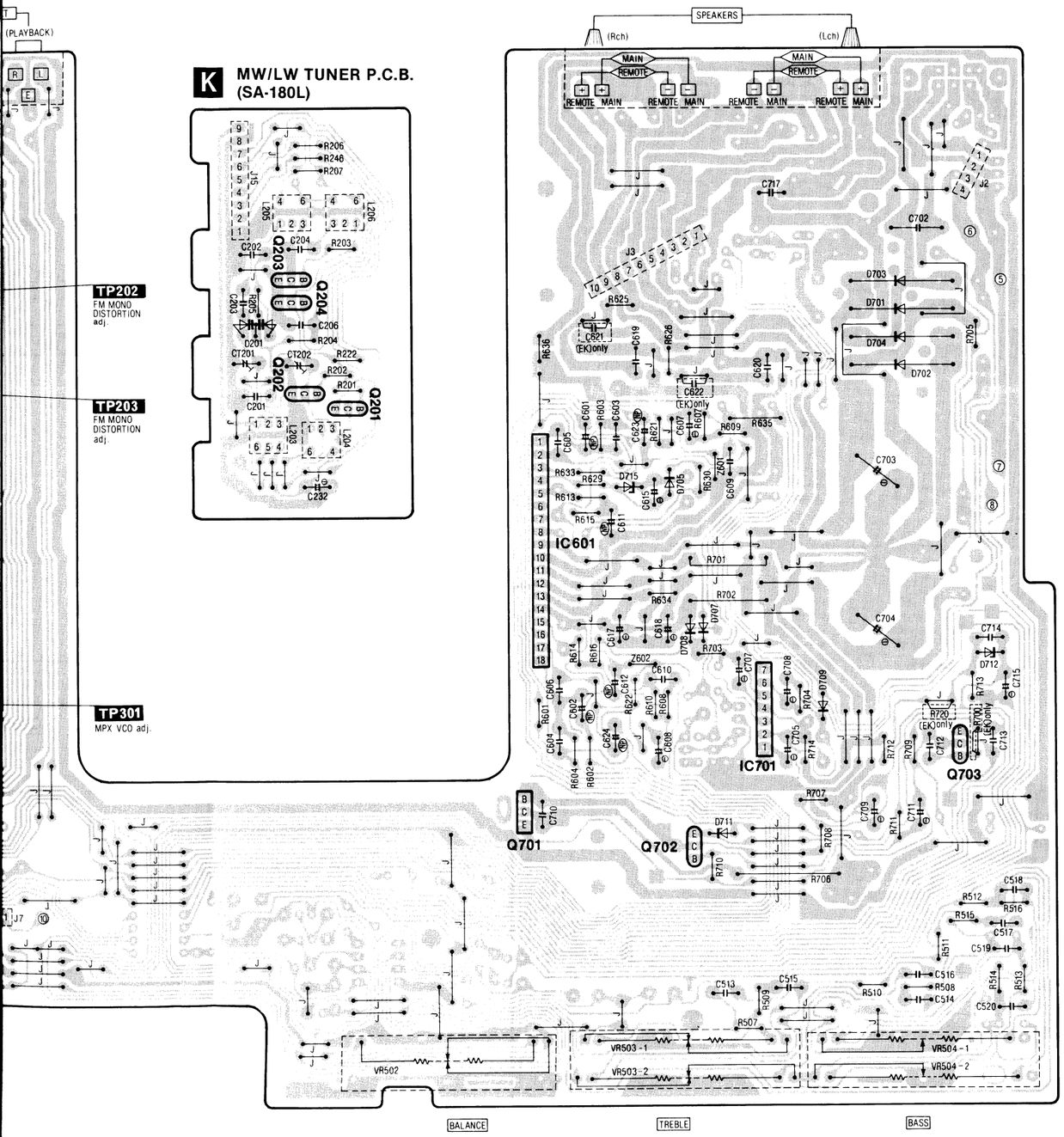




G VOL

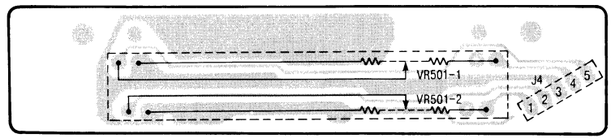
H SPE



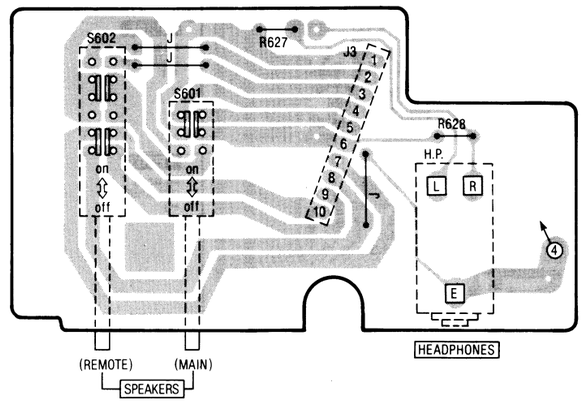


K MW/LW TUNER P.C.B. (SA-180L)

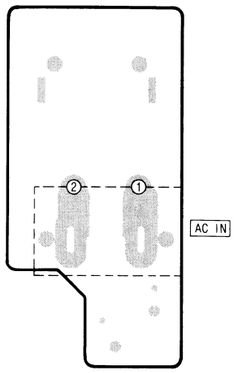
G VOLUME CONTROL P.C.B. (SA-180/180L)



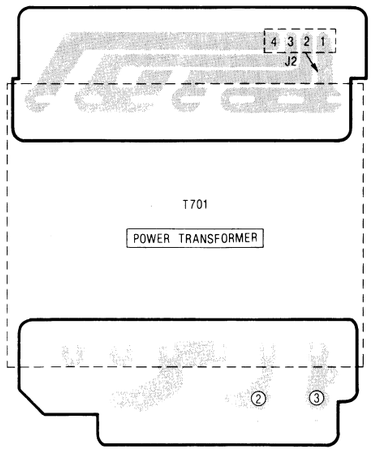
H SPEAKER SELECTOR P.C.B. (SA-180/180L)



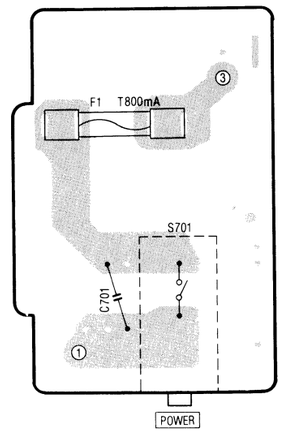
I AC SOCKET P.C.B. (SA-180/180L)



(SA-180/180L)

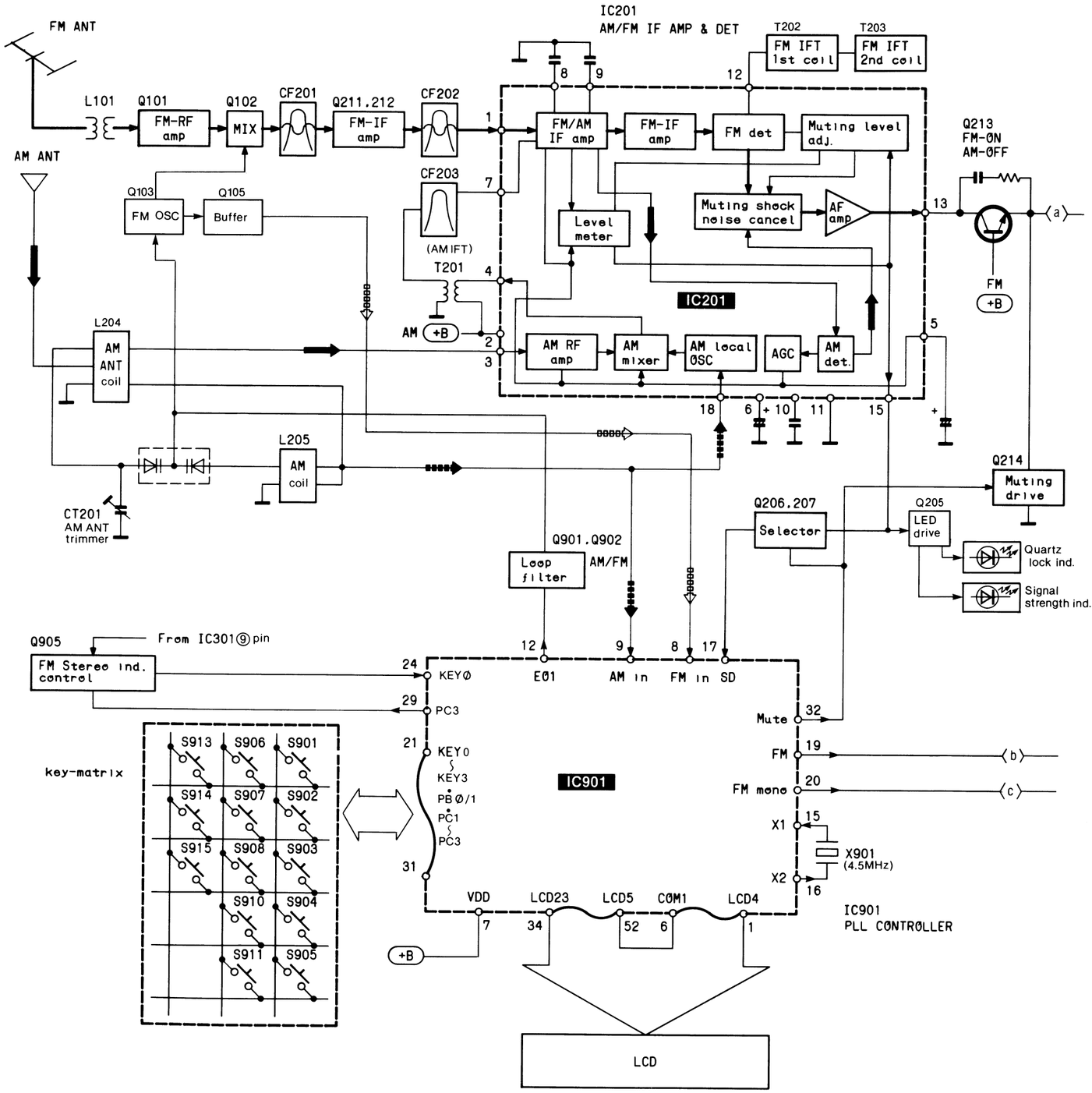


J POWER SWITCH P.C.B. (SA-180/180L)

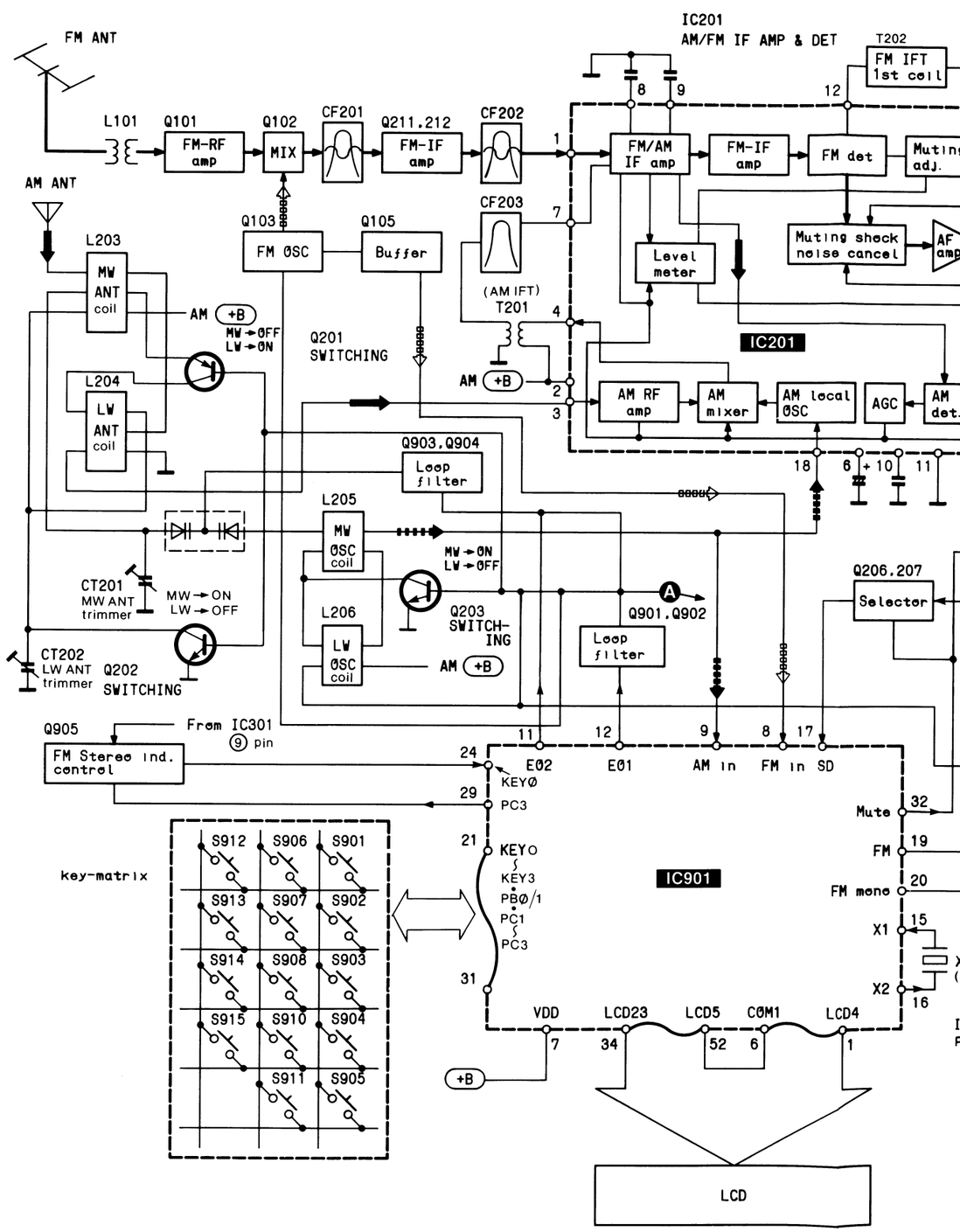


■ BLOCK DIAGRAM

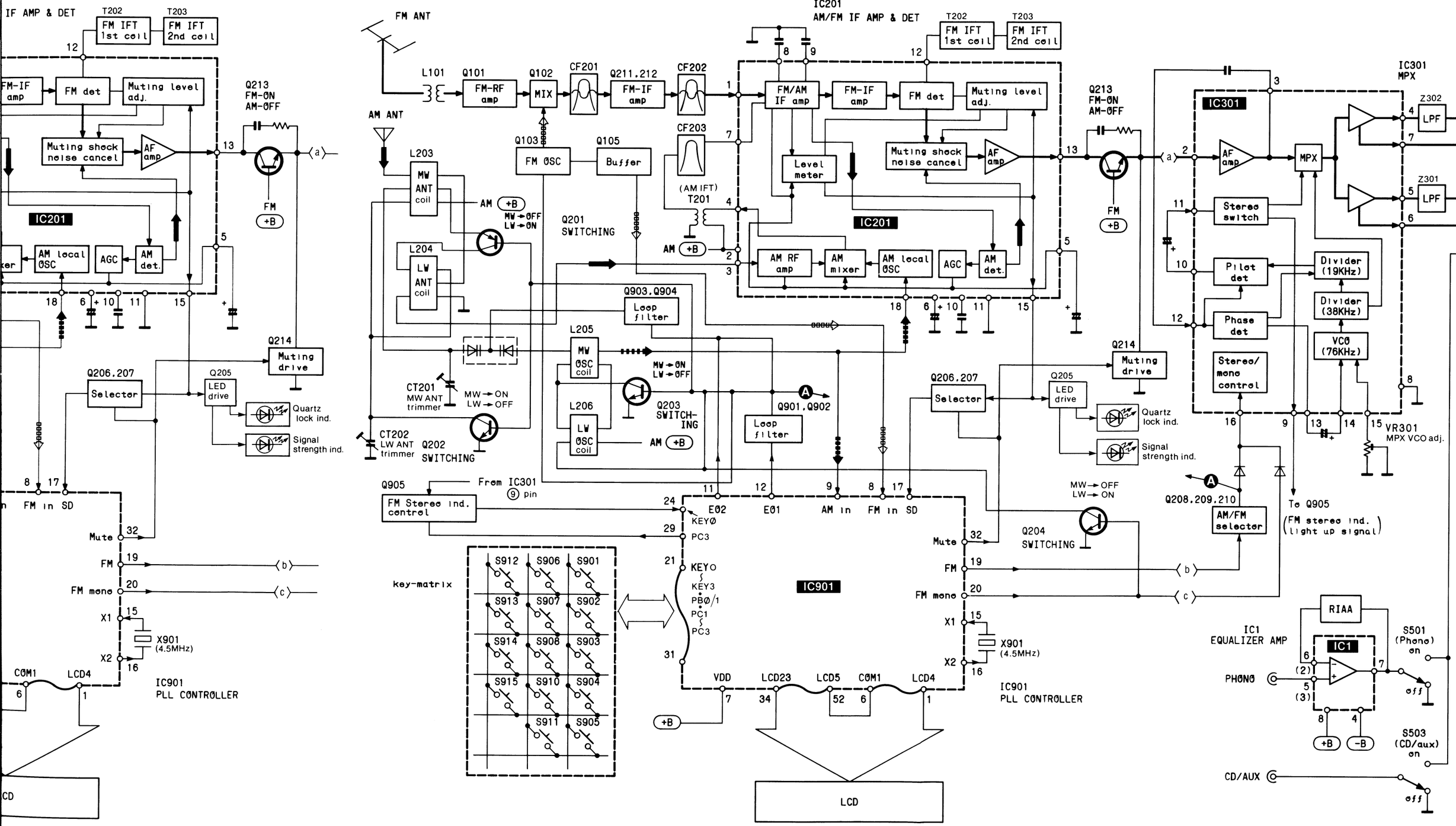
(SA-180)



(SA-180L)



(SA-180L)


IF AMP & DET
T202
FM IFT 1st coil
T203
FM IFT 2nd coil
FM-IF amp
FM det
Muting level adj.
Muting shock noise cancel
AF amp
IC201
AM local OSC
AGC
AM det.
Q213
FM-ON AM-OFF
FM +B
Q214
Muting drive
Q206.207
Selector
Q205
LED drive
Quartz lock ind.
Signal strength ind.
FM IN SD
Mute
FM
FM mono
X1
X2
X901 (4.5MHz)
COM1
LCD4
IC901 PLL CONTROLLER
CD
FM ANT
AM ANT
L101
Q101
FM-RF amp
Q102
MIX
CF201
Q211.212
FM-IF amp
CF202
CF203
(AM IFT) T201
Q103
FM OSC
Q105
Buffer
Q201 SWITCHING
L203
MW ANT coil
AM +B
MW→OFF LW→ON
L204
LW ANT coil
CT201 MW ANT trimmer
MW→ON LW→OFF
CT202 LW ANT trimmer
Q202 SWITCHING
L205
MW OSC coil
L206
LW OSC coil
Q903.Q904
Loop filter
MW→ON LW→OFF
Q203 SWITCHING
AM +B
Q901.Q902
Loop filter
IC201
AM/FM IF AMP & DET
FM/AM IF amp
Level meter
AM RF amp
AM mixer
AM local OSC
AGC
AM det.
Muting shock noise cancel
AF amp
Q905
From IC301 (9) pin
FM Stereo ind. control
key-matrix
S912 S906 S901
S913 S907 S902
S914 S908 S903
S915 S910 S904
S911 S905
KEY0
KEY3
PB0/1
PC1
PC3
E02
E01
AM in
FM in SD
VDD
LCD23
LCD5
COM1
LCD4
IC901
LCD
IC301
MPX
Z302
Z301
LPF
De-emphasis
Stereo switch
Pilot det
Phase det
Divider (19KHz)
Divider (38KHz)
VCO (76KHz)
Stereo/ mono control
VR301
MPX VCO adj.
Q208.209.210
AM/FM selector
To Q905
(FM stereo ind. light up signal)
MW→OFF LW→ON
Q204 SWITCHING
IC1
EQUALIZER AMP
RIAA
PHONO
S501 (Phono) on
S503 (CD/aux) on
CD/AUX
off

IC201
AM/FM IF AMP & DET
T202
FM IFT
1st coil
T203
FM IFT
2nd coil
FM/AM
IF amp
FM-IF
amp
FM det
Muting level
adj.
Muting shock
noise cancel
AF
amp
Level
meter
IC201
AM RF
amp
AM
mixer
AM local
OSC
AGC
AM
det.
Q213
FM-ON
AM-OFF
FM
+B
IC301
MPX
IC301
AF
amp
MPX
Stereo
switch
Pilot
det
Phase
det
Stereo/
mono
control
Divider
(19KHz)
Divider
(38KHz)
VCO
(76KHz)
Z302
LPF
De-
emphasis
Z301
LPF
De-
emphasis
Rch
Tape/
ext
Rec out
Playback
tape
S502
(Tuner)
on
off
source
S504
(Tape monitor)
VR501
(Volume)
Loudness
on
off
S603
(Loudness)
VR502
(Balance)
Rch
IC601
2CH POWER AMP
IC601
Voltage
amp
Power
amp
Differential
Current
stabi.
Bias
control
Current
stabi.
Power
amp
Bass
Treble
Muting
+B
HEADPHONES
Rch
S601
(Main)
on
off
MAIN
S602
(Remote)
REMOTE
Q214
Muting
drive
Q206.207
Selector
Q205
LED
drive
Quartz
lock ind.
Signal
strength ind.
Q901.Q902
Loop
filter
MW→OFF
LW→ON
Q208.209.210
AM/FM
selector
To Q905
(FM stereo ind.
light up signal)
Q204
SWITCHING
E02
E01
AM in
FM in
SD
Mute
FM
FM mono
IC901
X1
X2
X901
(4.5MHz)
VDD
LCD23
LCD5
COM1
LCD4
IC901
PLL CONTROLLER
LCD
IC1
EQUALIZER AMP
RIAA
IC1
PHONO
S501
(Phono)
on
off
S503
(CD/aux)
on
CD/AUX
off
IC701
MUTING & PROTECTION
IC701
Power ON/OFF
det
Over load
det
Muting
Bias
D701 ~ 704
(Rectifier)
T701
AC IN
-B
+B
Q701 ~ 703
Regulator
PL2
PL1

Note)
- FM Sig
- FM OS
- AM Sig
- AM OS

■ REPLACEMENT PARTS LIST (SA-180L)

Notes: * Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
* Bracketed indications in Ref. No. columns specify the area.
Parts without these indications can be used for all areas.

* Ⓚ-marked parts are used for black only, while Ⓢ-marked parts are for silver type only.
* Part other than Ⓚ-and Ⓢ-marked are use for both black and silver type.
* Ⓜ mark stands for that the parts are supplied in MESA.

Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC1	AN6558F	I.C.EQ AMP
IC201	AN7273A	I.C.FM I.F DET
IC301	AN7470	I.C.FM MPX
IC601 ⚠	SVIK4152-2M	I.C.2CH-POWER
IC701 ⚠	AN7072N	I.C.MUTING
IC901	UPD1718G514	I.C.PLL CON.
TRANSISTORS		
Q101	2SK241GR	TRANSISTOR, SI
Q102	2SC2786M	TRANSISTOR
Q103, Q105	2SC2787L	TRANSISTOR
Q201	2SA1175FE	TRANSISTOR
Q202, Q203	2SC2785F	TRANSISTOR
Q204	2SC2785F	TRANSISTOR
Q205	2SC1685-QNC	TRANSISTOR
Q206	2SA1175FE	TRANSISTOR
Q207	2SC2785F	TRANSISTOR
Q208, Q209	2SA1175FE	TRANSISTOR
Q210	2SC2785F	TRANSISTOR
Q211, Q212	2SC2787L	TRANSISTOR
Q213, Q214	2SC2785F	TRANSISTOR
Q701	2SD1265-0	TRANSISTOR
Q702	2SC2785F	TRANSISTOR
Q703	2SC1384A-R	TRANSISTOR
Q901, Q902	2SC2785F	TRANSISTOR
Q903, Q904	2SC2785F	TRANSISTOR
Q905	2SA1175FE	TRANSISTOR
DIODES		
D102, D104	MA325G-Y	ZENER
D201	KV1260Z	DIODE
D202, D203	LN446YP	L.E.D
D204	LN846RP	L.E.D
D206	SLV31VC3	L.E.D
D207	MA165	DIODE
D209	MA4110M	DIODE
D301, D303	MA165	DIODE
D701, D702 ⚠	SVDS2V20	RECTIFIER
D703, D704 ⚠	SVDS2V20	RECTIFIER
D705, D707	MA165	DIODE
D708, D709	MA165	DIODE
D711	MA4062-M	DIODE
D712	MA4160M	DIODE, SI
D715	MA4240H	DIODE
D901	MA4110M	DIODE
D902, D903	MA165	DIODE
D904, D905	MA165	DIODE
D906, D907	MA165	DIODE
D908, D909	MA165	DIODE
D910, D911	MA165	DIODE
D912, D913	MA165	DIODE
D915, D916	MA162A	DIODE
D917, D920	MA165	DIODE
VARIABLE RESISTORS		
VR301	QVNB3A00B472	V.R.MPX VCO
VR501	EWAPBAX05B15	V.R.MAIN
VR502	EWANF5X05G15	V.R.BALANCE
VR503, VR504	EWANA6X05C15	V.R.TONE
VARIABLE CAPACITORS		
CT101	ECRHA007A41	TRIMMER
CT201	ECRHA010A41	TRIMMER
CT202	ECRHA020D41	POLYETHYLENE CAPACITOR
COILS AND TRANSFORMERS		
L101	SLA4N39	ANTENNA COIL
L102	ELEPK1R2MA	COIL
L103	SLD4P87	COIL
L105	ELEPK1R2MA	COIL
L106	SL04N27-P	COIL
L111	RLQY25S5	CHOKE COIL
L203	SLA2B3-P	ANTENNA COIL
L204	SLA1B7R-P	ANTENNA COIL
L205	SL02B9R-P	OSCILLATOR COIL
L206	SL01B5-P	OSCILLATOR COIL
L210, L211	ELEPK1R0MA	COIL
L901	RLQY25S5	CHOKE COIL
L902	ELEPK1R2MA	COIL
T201	SLI2B101-M	I.F.TRANSFORMER
T202	SLI4B511-Z	I.F.TRANSFORMER
T203	SLI4B513-Z	I.F.TRANSFORMER
T701 ⚠ (EW, EF, EB)	SLT5M466	POWER TRANSFORMER
T701 ⚠ (EK)	SLT5M467	POWER TRANSFORMER
COMPONENT COMBINATIONS		
Z301, Z302	EXRP181K473C	C-R COMBINATION
Z601, Z602	EXPC150K153S	COMPONENT COM. Ⓜ
FILTERS		
CF201	SVFE107MS8A	CERAMIC FILTER (RED)
CF201	SVFE107MS8D	CERAMIC FILTER (BLACK)
CF201	SVFE107MS8E	CERAMIC FILTER (WHITE)
CF202	SVFE107MS8A	CERAMIC FILTER (RED)
CF202	SVFE107MS8D	CERAMIC FILTER (BLACK)
CF202	SVFE107MS8E	CERAMIC FILTER (WHITE)
CF203	SVFSFZ450F7L	CERAMIC FILTER
OSCILLATORS		
X901	SVQ49U452-T	OSCILLATOR
DISPLAYS		
LCD1	SALHLC9225-3	LIQUID CRYSTAL DISPLAY
LAMPS		
PL1 ⚠	XAMR83S150A	PILOT LAMP
PL2 ⚠	XAMR78S150	PILOT LAMP
FUSES		
F1 ⚠ (EK)	XBA2C08TB0	FUSES 250V.T0.8A
F1 ⚠ (EW, EF, EB)	XBA2C08TR0	FUSE
SWITCHES		
S501, S502	SSH497	SWITCH, PH./TUNER
S503, S504	SSH497	SWITCH, CD/AUX/MO
S601, S602	SSH2108-1	SWITCH, SPEAKER
S603	SSH1159	SW, LOUDNESS
S701 ⚠	SSH1071	SWITCH, POWER
S901, S902	SSG13	SW
S903, S904	SSG13	SW
S905, S906	SSG13	SW
S907, S908	SSG13	SW
S909, S910	SSG13	SW
S911, S912	SSG13	SW
S913, S914	SSG13	SW
S915	SSG13	SW

Ref. No.	Part No.	Description
CABINET AND CHASSIS		
1	SWV66	L.E.D
2 Ⓢ	SBDA2029-SM	KNOB
2 Ⓚ	SBDA290-KM	KNOB
3 Ⓚ	SGYA180L-KE	FRONT PANEL Ⓜ
3 Ⓢ	SGYA180L-SE	FRONT PANEL Ⓜ
4 Ⓢ	SBC571-T	BUTTON, SPEAKER
4 Ⓚ	SBC571-10T	BUTTON, SPEAKER
5 Ⓢ	SBC666	BUTTON, POWER
5 Ⓚ	SBC666-5	BUTTON, POWER
6	SHG6380	RUBBER SPACER
7	SGX7809	ORNAMENT
8	SJT347	FUSE HOLDER
9	SHR9789	PLASTIC SPACER
10	SUX39	BRACING STRUT
11	SUW2974	BRACKET
12	SMC6395-1	SHIELD COVER
13	SHR9771-2	PLASTIC SPACER
14	SDU249-1	GALSS, TRANSPARENT PLATE
15	SMP395-2	ANGLE
16	SHR415	LOCK PIN
17	SUB251	ROD
18	SKUA180-KM	BOTTOM BOARD Ⓜ
18-1	SKL293	RUBBER
19	SHE185-1	SPACER
20 Ⓢ	SBC315-4T	BUTTON, LOUDNESS
20 Ⓚ	SBC315-7	BUTTON, LOUDNESS
21 Ⓚ	SHR5310	PLASTIC SPACER
21 Ⓢ	SHR5310-1	PLASTIC SPACER
22 Ⓚ	SKCA290-KG	CABINET
22 Ⓢ	SKCA290-SG	CABINET BODY
23 Ⓢ	SBD97	KNOB, TONE
23 Ⓚ	SBD97-3	KNOB, TONE
24	SUW2928-2	BRACKET
25	SUW2975	BRACKET
26	SJF4818	TERMINAL BOARD, SPEAKER
27	SJF3059-14N	TERMINAL BOARD, INPUT
28	SJF4441-4	TERMINAL BOARD, ANTENNA
29 (EF)	SGPA180L-KF	REAR PANEL Ⓜ
29 (EK)	SGP6703C	REAR PANEL Ⓜ
29 (EW, EB)	SGP6703D	REAR PANEL Ⓜ
30	SJS9231B	AC INLET
31	SJS9231A	AC, INLET COVER
34	SHR9748	PLASTIC SPACER
35	SJJ126B	JACK
37 Ⓚ	SBCA180-KE1	BUTTON, PHONO Ⓜ
37 Ⓢ	SBCA180-SE1	BUTTON, PHONO Ⓜ
38 Ⓚ	SBCA180-KE2	BUTTON, TUNER Ⓜ
38 Ⓢ	SBCA180-SE2	BUTTON, TUNER Ⓜ
39 Ⓚ	SBCA180-KE3	BUTTON, CD Ⓜ
39 Ⓢ	SBCA180-SE3	BUTTON, CD Ⓜ
40 Ⓚ	SBCA180-KE4	BUTTON Ⓜ
40 Ⓢ	SBCA180-SE4	BUTTON Ⓜ
41	SJT30340LX-V	CONNECTOR(3-P)
42 Ⓢ	SHR9764-4	PLASTIC SPACER
42 Ⓚ	SHR9764-5	PLASTIC SPACER
45	SUW2013-1	BRACKET
46	SHR301	CLAMPER
SCREWS, WASHERS AND NUTS		
N1	XTB3+8G	SCREW
N2	XTBS3+8JFZ1	SCREW
N3	XTW3+8T	SCREW
N4	XTBS3+16F1	SCREW
N5 Ⓢ	SNE2129-2	ORNAMENT SCREW
N5 Ⓚ	SNE2129-3	ORNAMENT SCREW
N6	SNE2117-1	SCREW
N7	SNE2118	SCREW
N8	XTBS3+8FFZ1	TAPPING SCREW

Ref. No.	Part No.	Description
PACKINGS		
P1 (EK)	SPG6103	CARTON BOX Ⓜ
P1 (EW, EB)	SPG6104	CARTON BOX Ⓜ
P1 (EF)	SPG6105	CARTON BOX Ⓜ
P2	SPS4433-3	PAD
P3	SPS4432-3	PAD
P5	SPS4693	PAD
P6	SPP719	PROTECTION COVER
ACCESSORIES		
A1 ⚠ (EB)	SFDAC05E02	POWER CORD
A1 ⚠ (EW, EF)	SFDAC05E03	POWER CORD
A1 ⚠ (EK)	SFDAC05G02	POWER CORD
A2	SSA270M	FM ANTENNA
A3	SSA902-5	ANTENNA
A4	SMA231	HOLDER (FOR SET)
A5	SMA233-1	ANTENNA HOLDER (FOR RACK)
A6	XTN3+10AFZ	SCREW
A7	SQF13060	INSTRUCTION BOOK Ⓜ
A9	SJP9009	PLUG

■ SCHEMA

(This schematic diag
development of new

Note 1:

- **S501～S503** : Input
  [S50
  L S50
- **S504** : Tape r
  (▬ tap
- **S601** : Main s
  (▬ on,
- **S602** : Remot
  (▬ on,
- **S603** : Loudn
  (▬ on,
- **S701** : Power
  (▬ on,
- **S901～S908** : Preset
  [S90
  S90
  S90
  L S90
- **S909** : Memor
  (manua
- **S910** : FM mo
  (auto –
- **S911～S913** : Band
  (S911 –
  S913 –
- **S914, S915** : Tuning
  (S914 –
- ⟹ FM signal li
  □□□□ FM OSC
  ■■■■ AM (MW), L
- Important safety not
  Components identifie
  important for safety.
  use only manufactur
- Indicated voltage val
  by the DC electronic
  taken as standard.
  voltage values, deper
  tester.
- * All voltage values sh
  (stereo signal) recep
- * Figures in ( ) sta
- * Figures in ⌜ ⌟ sta
- * Figures in ▭ stan

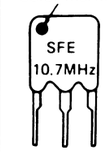
Part No.	Origi
D915, D916	MA15

Note 2:

- **Use of ceramic fi**

The ceramic filters (C
are available in two r
ceramics of the same r
At repairing and rep
(D915, D916) for us
on each rank of the ce

Color marking



R (C
F
W
B

Ref. No.		Part No.	Description	
CABINET AND CHASSIS				
1		SWV66	L.E.D	
2	Ⓢ	SBDA2029-SM	KNOB	
2	Ⓚ	SBDA290-KM	KNOB	
3	Ⓚ	SGYA180L-KE	FRONT PANEL	Ⓜ
3	Ⓢ	SGYA180L-SE	FRONT PANEL	Ⓜ
4	Ⓢ	SBC571-T	BUTTON, SPEAKER	
4	Ⓚ	SBC571-10T	BUTTON, SPEAKER	
5	Ⓢ	SBC666	BUTTON, POWER	
5	Ⓚ	SBC666-5	BUTTON, POWER	
6		SHG6380	RUBBER SPACER	
7		SGX7809	ORNAMENT	
8		SJT347	FUSE HOLDER	
9		SHR9789	PLASTIC SPACER	
10		SUX39	BRACING STRUT	
11		SUW2974	BRACKET	
12		SMC6395-1	SHIELD COVER	
13		SHR9771-2	PLASTIC SPACER	
14		SDU249-1	GALSS,TRANSPARENT PLATE	
15		SMP395-2	ANGLE	
16		SHR415	LOCK PIN	
17		SUB251	ROD	
18		SKUA180-KM	BOTTOM BOARD	Ⓜ
18-1		SKL293	RUBBER	
19		SHE185-1	SPACER	
20	Ⓢ	SBC315-4T	BUTTON, LOUDNESS	
20	Ⓚ	SBC315-7	BUTTON, LOUDNESS	
21	Ⓚ	SHR5310	PLASTIC SPACER	
21	Ⓢ	SHR5310-1	PLASTIC SPACER	
22	Ⓚ	SKCA290-KG	CABINET	
22	Ⓢ	SKCA290-SG	CABINET BODY	
23	Ⓢ	SBD97	KNOB, TONE	
23	Ⓚ	SBD97-3	KNOB, TONE	
24		SUW2928-2	BRACKET	
25		SUW2975	BRACKET	
26		SJF4818	TERMINAL BOARD, SPEAKER	
27		SJF3059-14N	TERMINAL BOARD, INPUT	
28		SJF4441-4	TERMINAL BOARD, ANTENNA	
29 (EF)		SGPA180L-KF	REAR PANEL	Ⓜ
29 (EK)		SGP6703C	REAR PANEL	Ⓜ
29 (EW, EB)		SGP6703D	REAR PANEL	Ⓜ
30		SJS9231B	AC INLET	
31		SJS9231A	AC.INLET COVER	
34		SHR9748	PLASTIC SPACER	
35		SJJ126B	JACK	
37	Ⓚ	SBCA180-KE1	BUTTON, PHONO	Ⓜ
37	Ⓢ	SBCA180-SE1	BUTTON, PHONO	Ⓜ
38	Ⓚ	SBCA180-KE2	BUTTON, TUNER	Ⓜ
38	Ⓢ	SBCA180-SE2	BUTTON, TUNER	Ⓜ
39	Ⓚ	SBCA180-KE3	BUTTON, CD	Ⓜ
39	Ⓢ	SBCA180-SE3	BUTTON, CD	Ⓜ
40	Ⓚ	SBCA180-KE4	BUTTON	Ⓜ
40	Ⓢ	SBCA180-SE4	BUTTON	Ⓜ
41		SJT30340LX-V	CONNECTOR(3-P)	
42	Ⓢ	SHR9764-4	PLASTIC SPACER	
42	Ⓚ	SHR9764-5	PLASTIC SPACER	
45		SUW2013-1	BRACKET	
46		SHR301	CLAMPER	
SCREWS,WASHERS AND NUTS				
N1		XTB3+8G	SCREW	
N2		XTBS3+8JFZ1	SCREW	
N3		XTW3+8T	SCREW	
N4		XTBS3+16F1	SCREW	
N5	Ⓢ	SNE2129-2	ORNAMENT SCREW	
N5	Ⓚ	SNE2129-3	ORNAMENT SCREW	
N6		SNE2117-1	SCREW	
N7		SNE2118	SCREW	
N8		XTBS3+8FFZ1	TAPPING SCREW	

Ref. No.		Part No.	Description	
PACKINGS				
P1 (EK)		SPG6103	CARTON BOX	Ⓜ
P1 (EW, EB)		SPG6104	CARTON BOX	Ⓜ
P1 (EF)		SPG6105	CARTON BOX	Ⓜ
P2		SPS4433-3	PAD	
P3		SPS4432-3	PAD	
P5		SPS4693	PAD	
P6		SPP719	PROTECTION COVER	
ACCESSORIES				
A1	⚠	SFDAC05E02	POWER CORD	
(EB) A1	⚠	SFDAC05E03	POWER CORD	
(EW, EF) A1	⚠	SFDAC05G02	POWER CORD	
(EK) A2		SSA270M	FM ANTENNA	
A3		SSA902-5	ANTENNA	
A4		SMA231	HOLDER (FOR SET)	
A5		SMA233-1	ANTENNA HOLDER (FOR RACK)	
A6		XTN3+10AFZ	SCREW	
A7		SQF13060	INSTRUCTION BOOK	Ⓜ
A9 (EK)		SJP9009	PLUG	

■ SCHEMATIC DIAGRAM

(This schematic diagram may be modified at any time with the development of new technology.)

Note 1:

- **S501**~**S503** : Input selector switch in "**tuner**" position.
  [S501 — phono S502 — tuner
  S503 — CD/aux]
- **S504** : Tape monitor selector switch in "**source**" position.
  (▂ tape/ext, ▇ source)
- **S601** : Main speaker switch in "**on**" position.
  (▂ on, ▇ off)
- **S602** : Remote speaker switch in "**off**" position.
  (▂ on, ▇ off)
- **S603** : Loudness switch in "**off**" position.
  (▂ on, ▇ off)
- **S701** : Power switch in "**on**" position.
  (▂ on, ▇ off)
- **S901**~**S908** : Preset tuning switch.
  [S901 — CH1/CH9 S902 — CH2/CH10
  S903 — CH3/CH11 S904 — CH4/CH12
  S905 — CH5/CH13 S906 — CH6/CH14
  S907 — CH7/CH15 S908 — CH8/CH16]
- **S909** : Memory switch in "**manual**" position.
  (manual — auto)
- **S910** : FM mode selector switch in "**mono**" position.
  (auto — mono)
- **S911**~**S913** : Band mode selector switch in "**FM**" position.
  (S911 — FM, S912 — LW **(SA-180L only)**
  S913 — MW)
- **S914, S915** : Tuning switch.
  (S914 — up, S915 — down)

- ⇨ FM signal line ➡ AM (MW), LW signal line
  ⇨ FM OSC ▒ AF signal line
  ➡ AM (MW), LW OSC ⊏⊐ Positive and negative voltage line
- Important safety notice:
  Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
- Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.

* All voltage values shown in circuitry are DC voltage in FM signal (stereo signal) reception mode.
* Figures in ( ) stand for DC voltage in AM signal reception mode.
* Figures in ⌜ ⌟ stand for DC voltage in LW signal reception mode.
* Figures in ▭ stand for DC voltage in muting mode.

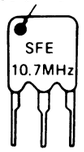
Part No.	Original Part No.	Supplyment Part No.
D915, D916	MA150	MA162A

Note 2:

- **Use of ceramic filters in pairs**

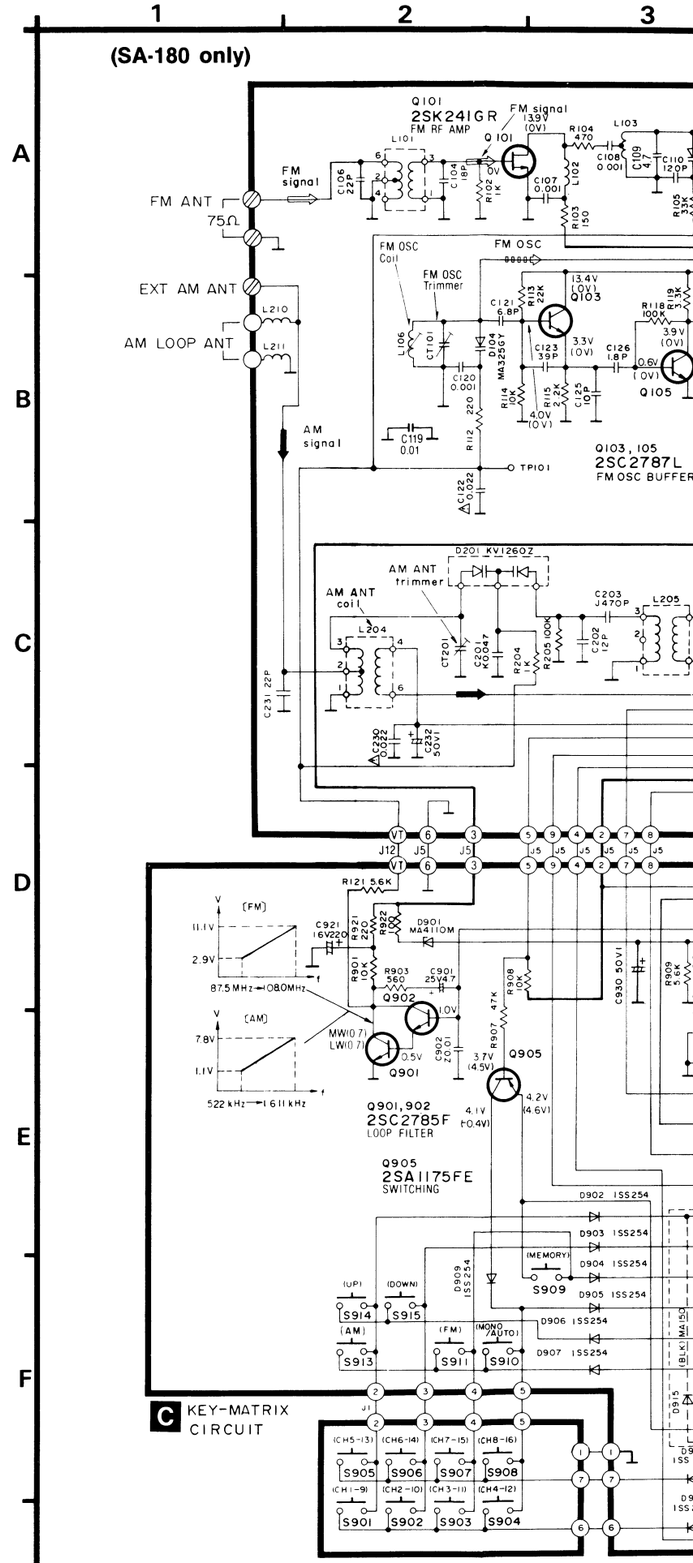
The ceramic filters (CF201, CF202 and CF203) for FM-IF circuit are available in two ranks. For this machine, be sure to use the ceramics of the same rank in a pair.
At repairing and replacement, pay close attention to the diode (D915, D916) for use as different diodes must be used depending on each rank of the ceramic filters.

Color marking



RANK (Color)	D915	D916	CENTER FREQUENCY
Red	X	X	10.70 MHz
White	X	○	10.75 MHz
Black	○	X	10.65 MHz

Note: ○ Mark Diode is used.
X Mark Diode is not used.



Description	
TERMINAL BOARD, INPUT	
TERMINAL BOARD, ANTENNA	
REAR PANEL	M
REAR PANEL	M
REAR PANEL	M
AC INLET	
AC INLET COVER	
PLASTIC SPACER	
JACK	
BUTTON, PHONO	M
BUTTON, PHONO	M
BUTTON, TUNER	M
BUTTON, TUNER	M
BUTTON, CD	M
BUTTON, CD	M
BUTTON	M
BUTTON	M
CONNECTOR(3-P)	
PLASTIC SPACER	
PLASTIC SPACER	
BRACKET	
CLAMPER	
SCREW	
SCREW	
SCREW	
SCREW	
ORNAMENT SCREW	
ORNAMENT SCREW	
SCREW	
SCREW	
TAPPING SCREW	

Description	
POWER CORD	
POWER CORD	
FM ANTENNA	
ANTENNA	
HOLDER (FOR SET)	
ANTENNA HOLDER (FOR RACK)	
SCREW	
INSTRUCTION BOOK	M
PLUG	

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  (S914 — up, S915 — down)
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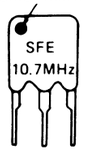

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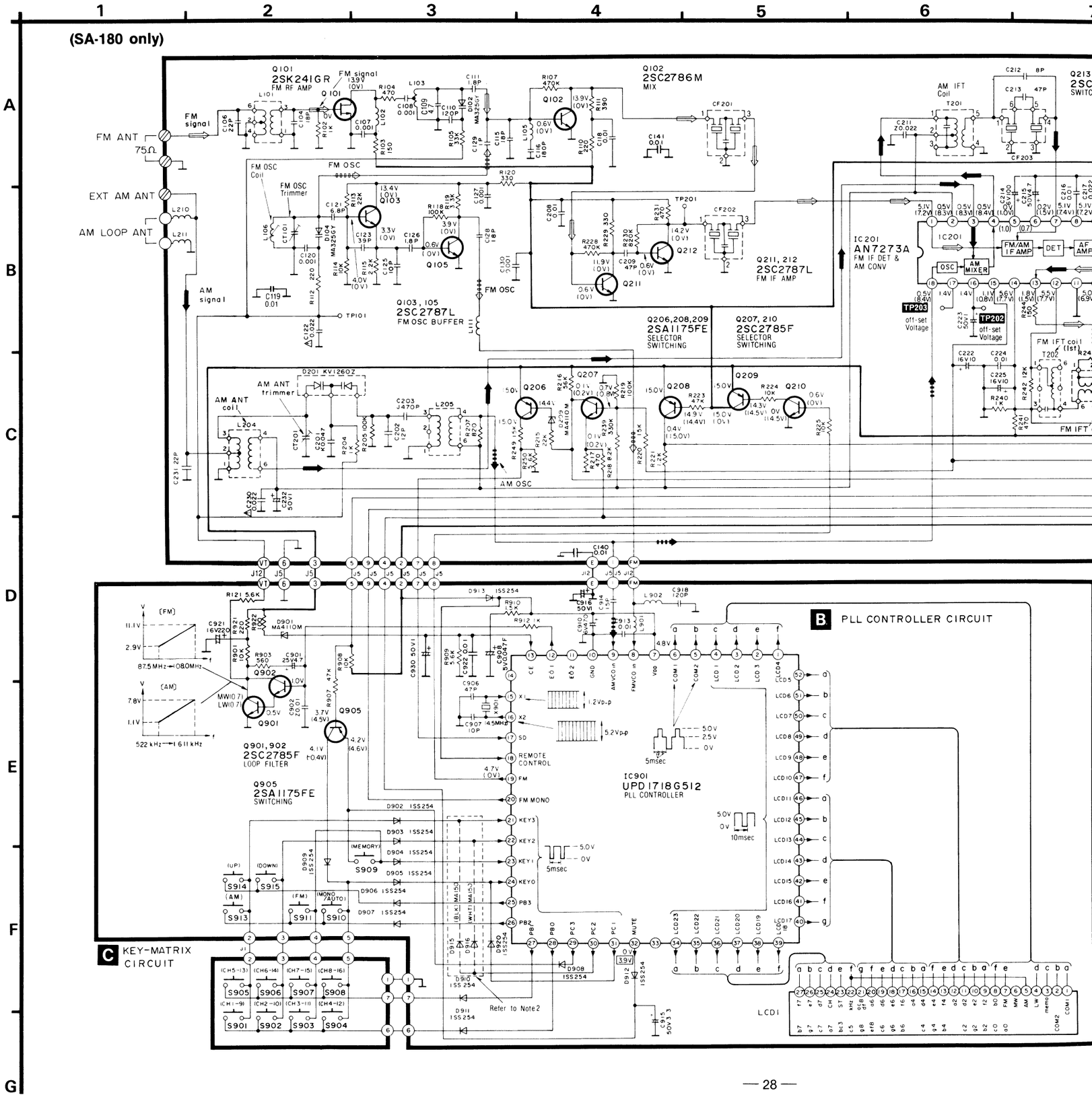
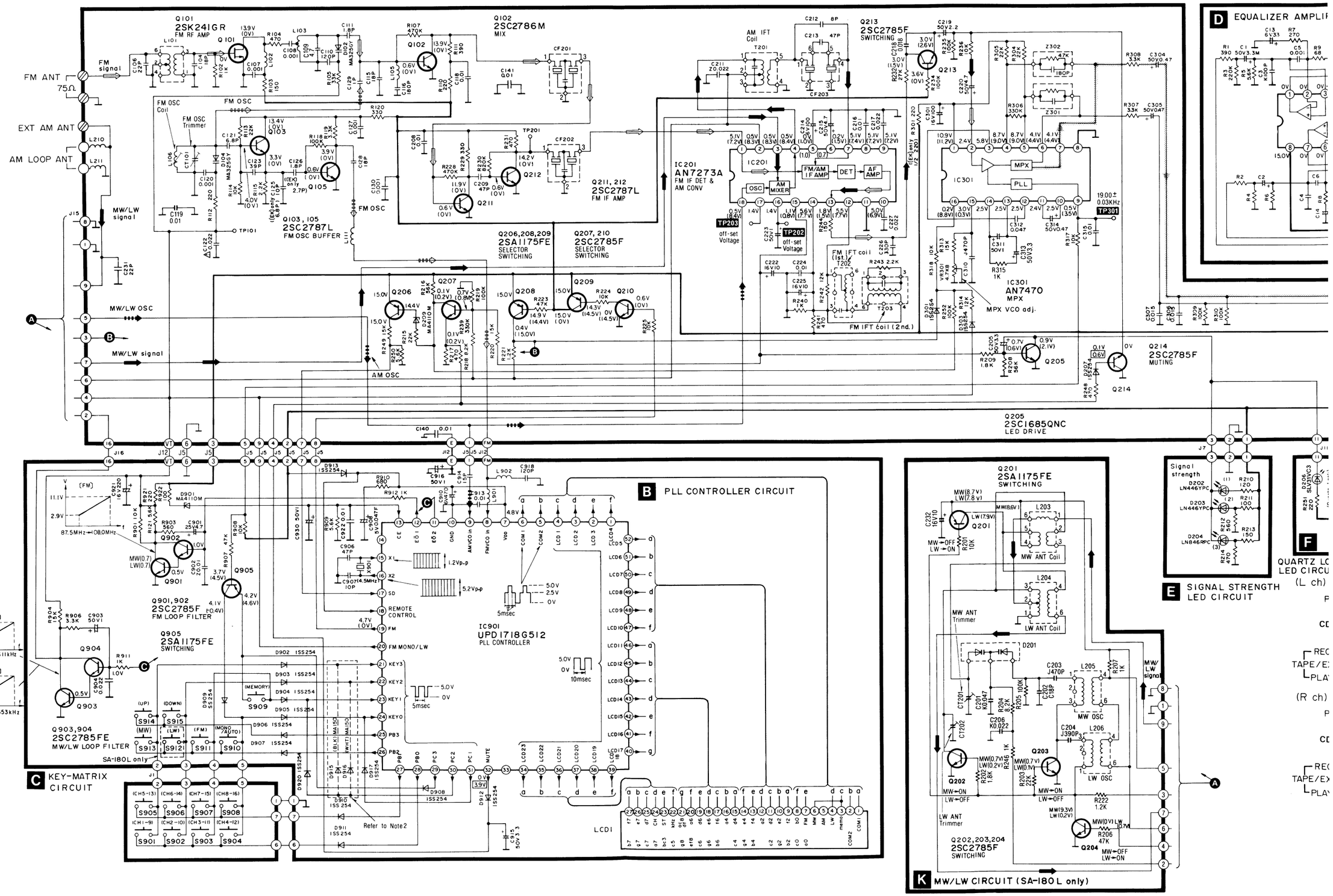
(SA-180 only)





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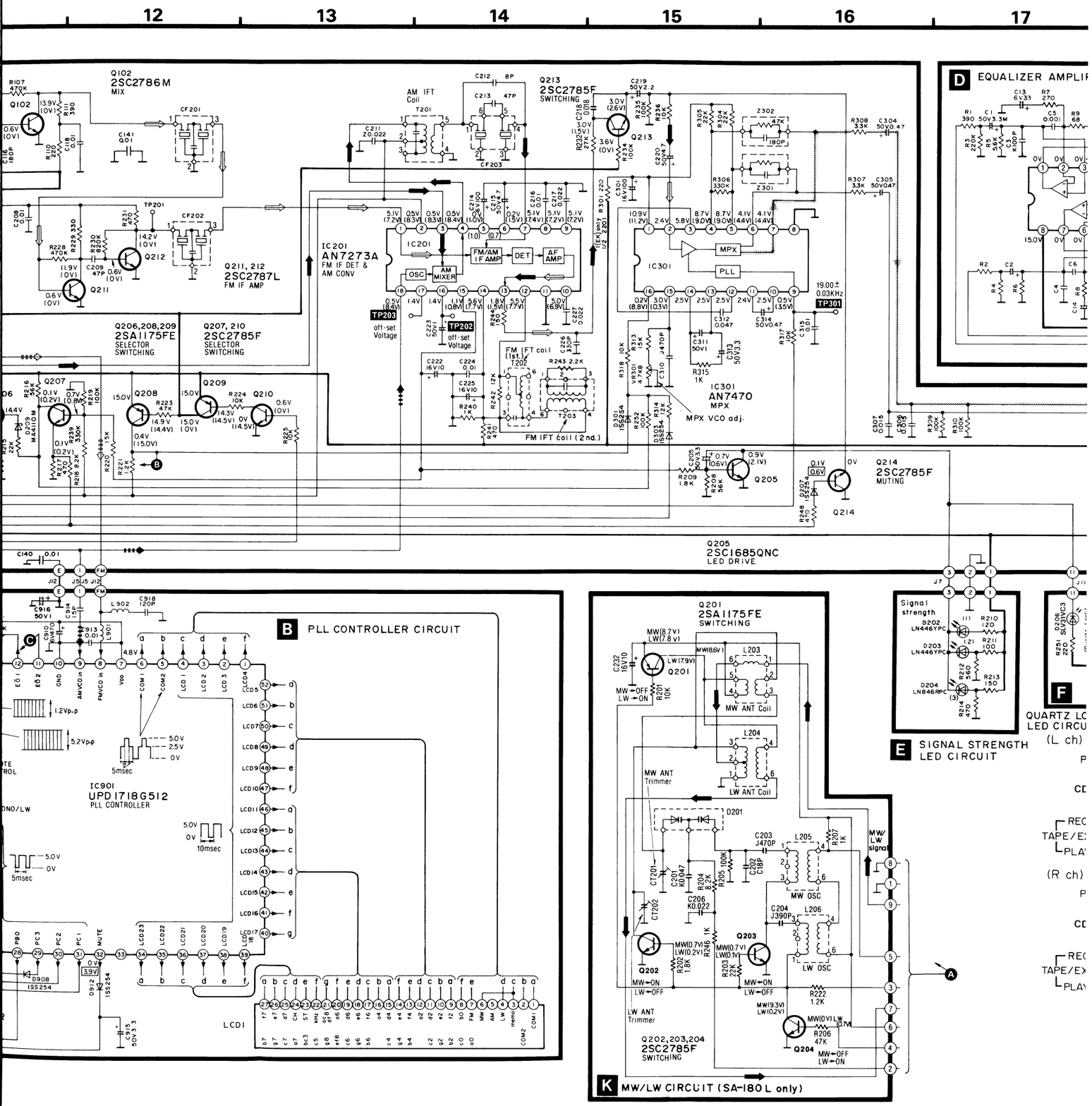
Notes: *

• Char

Ref.	
RESIS	
R201	
R202	
R203	
R204	
R206	
R207	
R222	
R246	
R634	
R700	
R712	
R720	
R904	
R906	
R911	
CAPA	
C125	
C126	
C140	
C202	
C204	
C206	
C230	
C232	
C619,	
C621,	
C903	
C904	
TRAN	
Q201	
Q202,	
Q204	
Q903,	
DIOD	
D917	
VARI	
CT202	
COIL	
L203	
L204	
L205	
L206	
T701	
SWIT	
S912	



■ REPLACEMENT PARTS LIST

Notes: * Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

* Bracketed indications in Ref. No. columns spe
area.
Parts without these indications can be used
areas.
* Ⓜ mark stands for that the parts are supplied in

• Change of Parts List (SA-180 from SA-180L)

Ref. No.	Change of Part No. SA-180L [EK]	→ SA-180 [EX, EH, EI]	Part Name & Description	Pcs/ Set	
RESISTORS					
R201	ERDS2TJ103	——		—	De
R202	ERDS2TJ182	——		—	De
R203	ERDS2TJ223	——		—	De
R204	ERDS2TJ822	**ERDS2TJ102**	1kΩ	(1)	
R206	ERDS2TJ473	——		—	De
R207	ERDS2TJ102	**ERDS2TJ821**	820Ω	(1)	
R222	ERDS2TJ122	——		—	De
R246	ERDS2TJ102	——		—	De
R634	ERQ12HJ820	——		—	De
R700	ERDS2TJ560	——		—	De
R712	ERDS1FJ821	**ERDS1FJ152**	1.5kΩ	(1)	
R720	ERDS1FJ681	——		—	De
R904	ERDS2TJ153	——		—	De
R906	ERDS2TJ332	——		—	De
R911	ERDS2TJ102	——		—	De
CAPACITORS					
C125	RCBS1H6R8KCY	**RCBS1H100JCY**	10pF	(1)	
C126	RCBS1H2R7KCY	**RCBS1H1R8MCY**	1.8pF	(1)	
C140	ECKD1H103PF	**ECBS1C103NYY**	0.01μF	(1)	
C202	ECCD1H180KC	**RCBS1H120JCY**	12pF	(1)	
C204	ECQP1391JZ	——		—	De
C206	ECKD1H223PF	——		—	De
C230	——	**ECKD1H223ZF**	0.022μF	(1)	Ac
C232	ECEA1CU100	**ECEA1HU010**	1μF	(1)	
C619, 620	ECFTD104KXL	**ECKD1H473ZF**	0.047μF	(2)	
C621, 622	ECFTD104KXL	——		—	De
C903	ECEA1HU010	——		—	De
C904	ECKD1H223PF	——		—	De
TRANSISTORS					
Q201	2SA1175FE	——		—	De
Q202, 203	2SC2785F	——		—	De
Q204	2SC2785F	——		—	De
Q903, 904	2SC2785F	——		—	De
DIODE					
D917	1SS254	——	DIODE	—	De
VARIABLE CAPACITOR					
CT202	ECRHA020D41	——	POLYTHYLENE CAPACITOR	—	De
COILS AND TRANSFORMER					
L203	SLA2B3-P	——	ANTENNA COIL	—	De
L204	SLA1B7R-P	**SLA2B1-1M**	ANTENNA COIL	(1)	
L205	SLO2B9R-P	**SLO2B7-M**	OSCILLATOR COIL	(1)	
L206	SLO1B5-P	——	OSCILLATOR COIL	—	De
T701	SLT5M467	**SLT5M466**	POWER TRANSFORMER	(1)	
SWITCH					
S912	SSG13	——		—	De